ALUMMIG™ Dual Pulse MIG Welder

Operating Manual

www.swswelding.com.au

THANK YOU FOR YOUR PURCHASE OF THE ALUMMIG™ 230 Digital TIG/MMA WELDING SYSTEM.

At SWS, we take pride in the professional quality, innovation, and support we deliver to our customers and the welding industry as a whole. The ALUMMIG™ 230 is the next step in our progression as the new standard in welding and cutting products delivered fast marking the continuing evolution of SWS. This welding machine is the latest development in inverter technology. It has been tested and approved by production welders and the best fabricating professionals in the industry.

Providing better outcomes through innovation and new product creation have been staples of SWS since its inception. It is the very principle by which we do business. Our goal has always been to provide an outstanding product that not only stands out from the competition but also reflects the quality we strive for in every aspect of our business philosophy. From our second to none customer service excellence to technical support, we work hard at what we do so that you can too.

We know you will enjoy using this machine!

The ALUMMIG™ 230 is manufactured and compliant with AS60974.1:2006, IEC60974.10, CE Guaranteeing you electrical safety and performance.

CAUTION!: The ALUMMIG™ 230 Operating Manual has been designed to instruct you on the proper use and operation of your SWS product. Your satisfaction with this system and its safe operation is our primary concern. It is important to take the time to read the entire manual, especially the safety sections. They will help you to avoid potential hazards that may exist when working with this product.

WARRANTY INFORMATION

This product comes with a 3 year warranty, for an extra 2 years extension please go to our website create a **MY SWS ACCOUNT** and register the equipment. This also helps us to assist you quickly in the event of a claim and gives you access to the MY SWS support portal.

This warranty covers
1. The Product only described against labour and faulty materials.
2. The replacement of parts and the repair labour used, for the remainder of the warranty period.

This warranty does not cover
1. If repairs are made or attempted by someone other than SWS Australia.
2. Normal wear and tear. Parts such as control boards main PCB boards etc. must be regularly inspected and kept as dust-free as possible.
3. Abuse, misuse, the subject of an accident, being dropped, crushed, impacted with any hard surface, exposed to extreme heat (including fire) or cold, improper maintenance, continued use after partial fail.
4. Acts of God, vermin or foreign matter entering, e.g. dirt and moisture. The tool should be regularly blown out with low-pressure air if the equipment is used near metal shavings.
5. If the Product has been modified, incorrectly adjusted or operated, the subject of incorrect electrical supply or inconsistent supply, or used with inappropriate accessories.
6. If the Product is tampered with or if any event of force has caused the damage.
7. If the Product has not been used or maintained in accordance with the manufacturer's instructions as provided with the product.
8. If the Product's serial number, as applied by the manufacturer, has been altered or removed from the product.

Liability
To the extent permitted by law (including the Competition and Consumer Act 2010(Cth) or New Zealand Consumer Guarantee Act 1993), in no event shall SWS, be liable for consequential, incidental or indirect damages or other losses or expenses incurred because of use or sale of the product.

How do you make a claim under warranty?
If your product may be faulty, please contact SWS so a qualified technician can diagnose any issues and the equipment can be returned to make warranty repairs, if necessary.

Australia/New Zealand
For service in Australia and New Zealand, the customer should contact the Australian Customer Service line on (03) 5766 2331

Return to SWS
If you qualify for a warranty claim, you will not be liable for any postage costs along with parts and labour. If you do not qualify for a claim, you will incur all expenses including postage cost and parts and labour for the repairs. All warranty claims and non-claimable maintenance will be done within one business day to ensure minimum downtime.

Important information
This warranty is in addition to all other rights and remedies you have under the Competition and Consumer Act 2010 (Cth) and the New Zealand Consumer Guarantee Act 1993 and any other laws in relation to the Products. Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and compensation for any other reasonably foreseeable loss or damage. You are also allowed to have the goods repaired or replaced if the products fail to be of acceptable quality, and the failure does not amount to a significant failure. Goods presented for repair may be replaced by refurbished goods of the same type rather than being repaired. Refurbished parts may be used to repair the products.

SPECIALISED WELDING SYSTEMS
WEBSITE: WWW.SWSWELDING.COM.AU
EMAIL: SUPPORT@SWSWELDING.COM.AU
TELEPHONE: (03) 5766 2331

INTRODUCTION

1.0 Welcome

The SWS ALUMMIG™ 230 is one of the most advanced, feature-packed and affordable digital MIG welding systems on the Australian market for welding of ferrous and non-ferrous metals. Featuring smart programming makes setting up easy for the beginner and versatile for the pro. You can depend on the ALUMMIG™ 230 to weld all day at its rated capacity and to pack more punch when you need it most.

Latest Inverter Technology Embedded microprocessor with Infineon components delivers ultimate durability and perfect welding characteristics.	**Revolutionary Digital Display** Large high visibility durable display allows easy viewing from a distance and continually provides you with necessary feedback for optimum welds.
Dual Pulse When welding thin gauge materials and joints like thin sheet metal and outside corners pulse allows you to focus the arc increase travel speed and minimise warpage.	**Superior Duty Cycle** Make bigger longer welds with ease. The duty cycle of 40% at 230 Amps and 100% at 140 Amps (40°C) gets most if not all jobs done.
Highly Portable Dependable IGBT inverter technology ensures a highly portable and lightweight unit weighing only 15kg.	**Meets the Highest Standards** Meets and exceeds the latest Australian, NZ and International electrical and electromagnetic compatibility standards. AS60974.1:2006, IEC60974.10, CE

SPECIFICATIONS

1.1 Specifications

Processes	Manual MIG, Single Pulse MIG, Dual Pulse MIG, Synergic MIG, TIG, Pulse TIG, MMA
Current Type	DC
Weldable Metals	Aluminium, Mild Steel, Stainless Steel, Specialty Metals
Industries	General Aluminium, Steel and Stainless Steel Fabrication, Stainless Steel Tank and Pipe Fabrication, Boat Building / Shipyards, Motorcycle custom shops, Automotive customs shops, Automotive Components and Repairs, Motorcycle Components and Repairs, Technical Schools, Aerospace, Agriculture, Farming, Building and Construction, Home Repair Workshops.
Input Voltage/Hz	1 Phase 230V +/- 15% (15 Amp Plug) 50/60 Hz
Minimum Generator	6.6kW (8.5kVA at 0.8 PF)
Duty Cycle 40°C AMB (TIG/MMA)	40% @ 230A, 100% @ 140A
Welding Current Range (TIG/MMA)	10-230 Amps
Dimensions	L 435mm H 360mm W 220mm
Weight	15Kg
Warranty	5 Years registered (3 Years standard)
Manufactured to Standards	AS60974.1:2006, IEC60974.10, CE

SAFETY

2.0 Hazards

WARNING

Arc welding and plasma cutting can be dangerous to yourself and others. Take special care when welding and cutting. Note your employer's safety practices which should be based on manufacturers' hazard data documents.

ELECTRIC SHOCK - Can kill

- Connect and earth (ground) the welding or plasma cutting unit adhering to applicable standards.
- Do not touch live electrical parts or electrodes with bare skin, wet gloves or wet clothing.
- Insulate yourself from the natural ground and the workpiece.
- Ensure your working stance is safe.

FUMES AND GASES - Can be dangerous to health.

- Keep your head out of the fumes.
- Use ventilation, extraction at the welding or cutting arc, or both, to take fumes and gases away from your breathing zone and the surrounding area.

ARC RAYS - Can injure eyes and burn skin.

- Protect your eyes and body. Use an approved welding/plasma cutting helmet and filter lens and wear protective clothing.
- Protect bystanders with suitable screens or curtains.

FIRE HAZARD

- Sparks (spatter) can cause fires. Make sure therefore that there are no flammable materials nearby.

NOISE - Excessive noise can damage hearing.

- Protect your ears. Use ear muffs or other suitable hearing protection.
- Warn all bystanders of the risk.

MALFUNCTION - Call an for expert assistance in the event of a malfunction.

CAUTION

This product is only intended welding. Any other use may result in personal injury and equipment damage.

CAUTION

Read and understand the instruction manual before installing or operating.

SAFETY

2.1 Precautions

Users of SWS welding and plasma cutting products have the primary responsibility for ensuring that anyone who works on or near this equipment adheres to all the relevant safety precautions. The following listed recommendations must be observed along with the standard regulations that apply to the workplace.

All use must be carried out by trained personnel well versed with the safe operation of the equipment. Incorrect operation of plasma cutting or welding equipment may lead to hazardous events which can result in serious injury to the user and damage to the equipment. Safety precautions must meet the requirements that apply to this type of welding or plasma cutting equipment.

1. Persons who use welding or plasma cutting equipment must be familiar with the following:
- Welding and plasma cutting machine operation
- Location of emergency stops
- The machines purpose
- Relevant safety precautions
- Arc welding and / or hand held plasma cutting

2. The user must make sure that:
- No unauthorized person in the vicinity of the working area of the equipment when it is used.
- No person is unprotected when the arc is started.

3. The workplace must:
- Be suitable for the purpose
- Be free from weather

4. Personal safety equipment:
- Always wear approved personal safety equipment, such as welding helmets, safety glasses, flame proof clothing and safety gloves.
- Never wear loose fitting items, such as hooded jumpers, bracelets, rings, etc., which can become trapped or cause serious injury burns.

5. General safety precautions:
- Ensure the return cable is connected securely.
- Work on high voltage equipment must only be carried out by a qualified electrician or electrical technician.
- Approved fire extinguishing equipment must be clearly marked and in the vicinity.
- Lubrication and maintenance must not be carried out on the equipment during operation.

READ AND UNDERSTAND THE OPERATING MANUAL BEFORE INSTALLING OR USING THIS EQUIPMENT - ALWAYS PROTECT YOURSELF AND OTHERS!

7.0 General Maintenance

Warning!
There is extremely dangerous voltage, and power levels present inside this product. Do not attempt to open or repair unless you are a qualified electrical tradespersons and you are qualified in training in power measurements and troubleshooting techniques. If major complex sub-assemblies are faulty, then the Power Source must be returned to an accredited service provider.

3 Months

Carefully clean exterior of power source with a dry brush.

6 Months

Unplug the power source remove cover and visually check and carefully clean the interior without touching any internal electrical components, wires or PCB boards and by taking special care not to damage any components. Use compressed air set at no more than 70 Psi to carefully blow out all dust and debris.

FRONT PANEL

1. Program - Select torch trigger mode and welding programs
2. Settings - Go to the settings menu
3. Memory - Save, Load or delete a program
4. Back - Go back to previous screen
5. Wire Feed - Fast feed use when installing new wire rolls
6. Gas Check - Check gas flow and or use as purge function
7. Rotary Encoder - Select and change functions
8. DCEP Port - Direct current electrode positive port
9. DCEN Port - Direct current electrode negative port
10. MIG EURO Port - MIG Torch port
11. Switch Port - Connect the TIG torch, Spool gun or Push Pull gun
12. Gas Outlet - Connect the TIG torch gas line

SIDE DOOR

1. MIG Torch EP Terminal - Electrode positive terminal with this connected the MIG torch is positive (EP) the ground lead goes to (-) port
2. MIG Torch EN Terminal - Electrode negative terminal with this connected the MIG torch is negative (EN) the ground lead goes to (+) port
3. Wire feeding unit
4. MIG wire spool carrier 200mm Diameter rolls only
5. Select spool gun or MIG torch and push pull torch operation

GMAW SETUP

1. For EN (Electrode Negative) MIG welding connect the ground cable
2. For EP (Electrode Positve) MIG welding connect the ground cable
3. Connect the MIG torch and use retaining nut to secure
4. If using a spool gun or push pull gun connect into socket
5. If using GAS connect the Gas line here to regulator
6. Select the chosen MIG welding mode

MMA SETUP

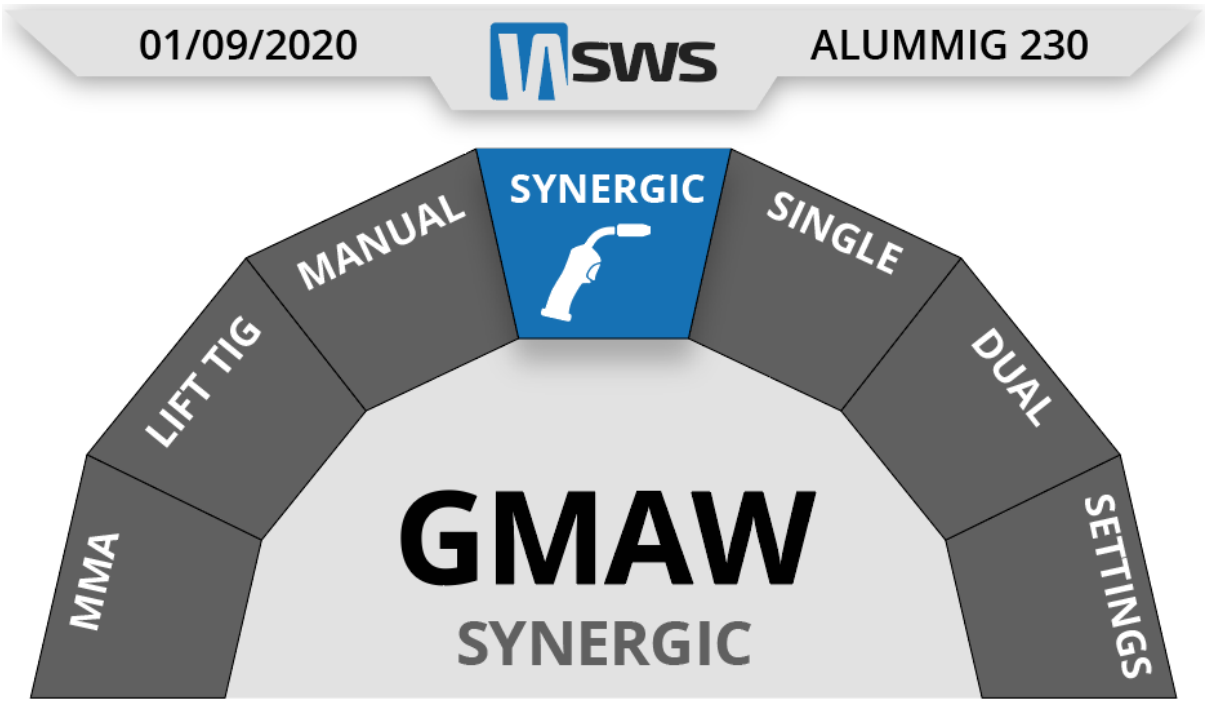
1. Connect the MMA Torch
2. Connect the Ground cable
3. Select MMA welding mode

GTAW SETUP

1. Connect the ground cable
2. Connect the TIG torch cable
3. Connect the TIG torch switch wire
4. Connect the TIG torch gas line
5. Connect the GAS line from regulator

MAIN MENU

From the main menu you can choose from GMAW, GTAW, or MMA welding modes. The screen will also display the current user and date in the top bar.



MMA - Stick welding mode and is used for the MMA arc welding process.

LIFT TIG - LIFT ARC TIG mode and includes pulse.

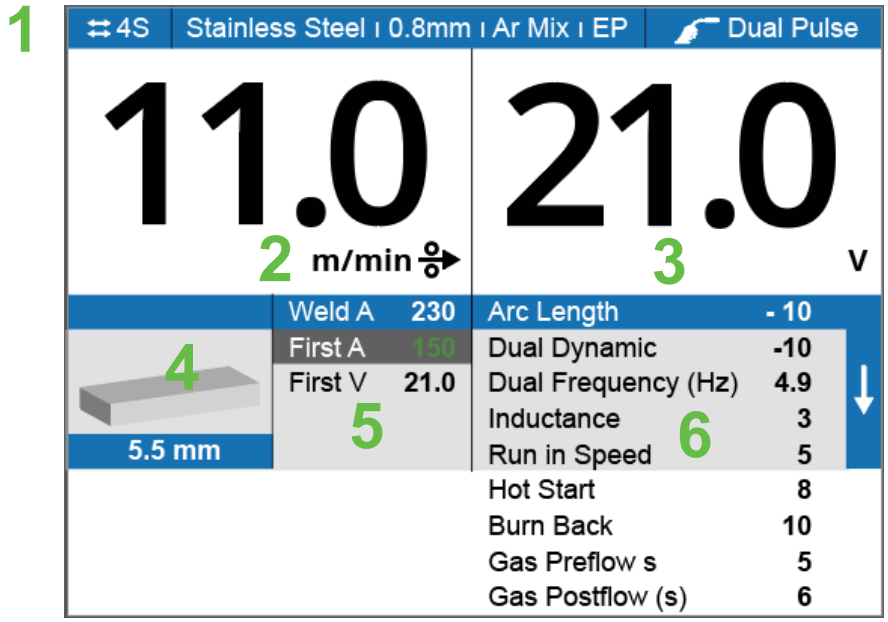
Manual MIG - Normal MIG welding mode so the wire speed and volts is set by the user.

Synergic MIG - The user can select the program then the machine adjust parameters accordingly for best results.

Single Pulse - The Pulse is set synergically and you can choose from a variety of preset programs.

Dual Pulse - Pulse Frequency and ratio can be set to further fine tune the welding characteristics. You can choose from all common welding consumables.

GMAW FUNCTIONS



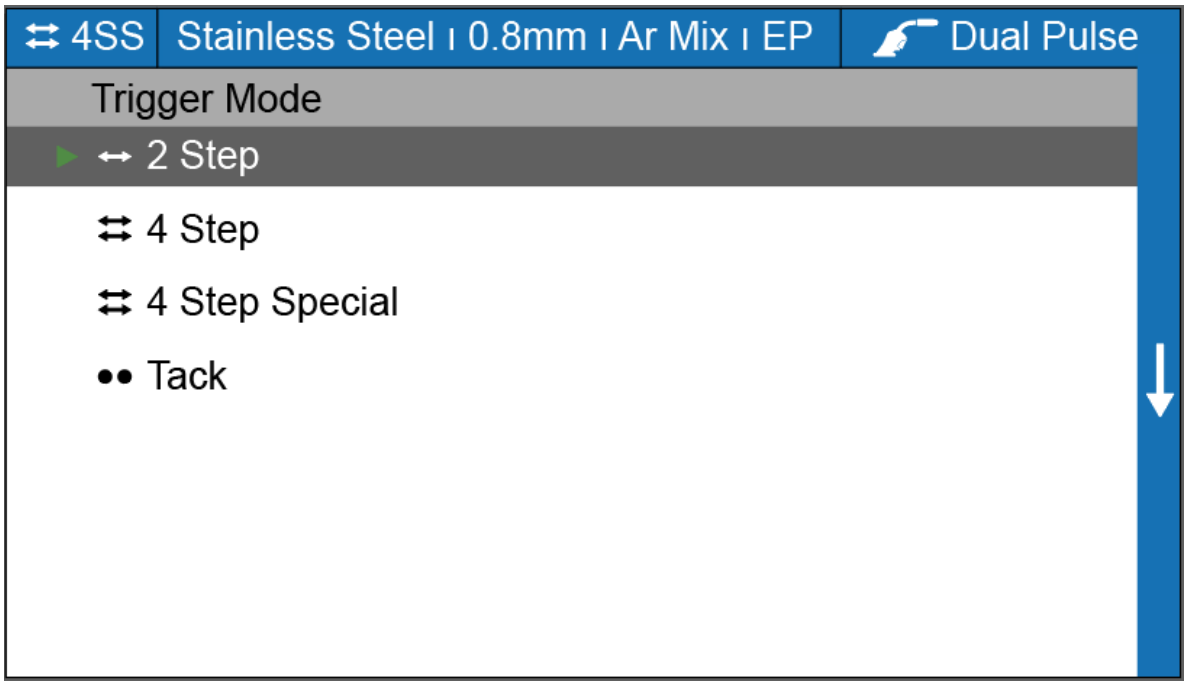
1. Program selection display - The top bar displays the welding modes selected.
2. Wire Speed - This adjusts the wire speed and corresponding amperage and will be a different ratio depending on the welding program selected.
3. Voltage and Arc Length - This adjusts the voltage which is relevant to the arc length and heat input. - 10 is a longer arc length with less heat and 10 is a short arc length with more heat.
4. Material Size - This gives an approximate size of the material being welded. It is only used as a starting point always a good idea to setup the machine on some scrap material first to prevent a poor weld.
5. 4T and 4T S Values - Adjust the amps / volts used for the torch trigger

6. Welding Parameters

Dual Dynamic - Percentage of dual pulse peak and base current utilised (- 10 to 10)
Dual Frequency - Sets the pulse frequency from (0.0 - 5.0 Hz) 1 Hz is 1 pulse per second.
Inductance - Adjust the rate of current rise following the short-circuit state thicker metals generally use higher inductance settings.
Run In Speed - This slows down the speed in which the wire is fed into the work piece. If wire stubbing or poor Arc starts are occurring use a low value setting of 0 the maximum setting is the full run in speed.
Hot Start - Increases the initial welding amperage (0 - 10) higher settings can help with arc starts.
Burn Back - Adjusts the amount of wire sickout after welding has stopped (0 -10) a higher number will produce a longer wire length.
Gas Preflow - Adjusts the amount of time the gas flows for before the arc starts (0 - 3.0)
Gas Postflow - Adjusts the amount of time the gas flows for after the arc stops (0 - 6.0)

TORCH TRIGGER MODES

The torch trigger modes can be used to change the welding amperage and voltage while welding. This can be useful for when welding aluminum to use higher values at the start of the weld and lower at the end as the metal heats up preventing burn through and as a crater current.



2 Step - Pull and hold the trigger to weld release to stop welding.

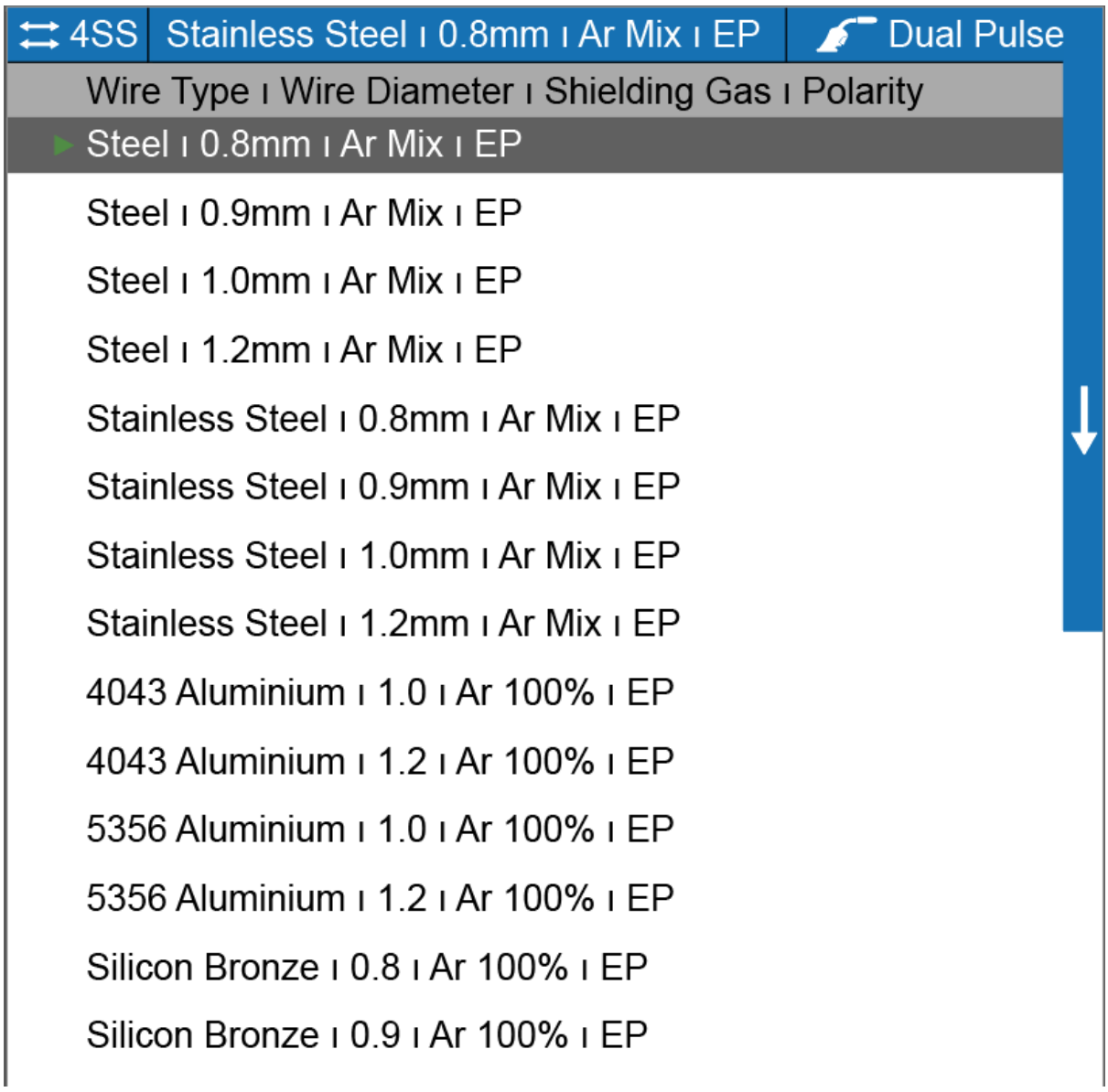
4 Step - Pull trigger for 1 second then release the to start welding pull trigger to activate last value welding parameters. Release to stop welding.

4 Step Special - Pull and hold trigger for first welding parameters, release for main welding parameters, pull and hold for last welding parameters.

Tack - Set the welding on time in seconds for consistent tack welds. (This parameter can be found in the MIG welding mode screens parameter box once selected)

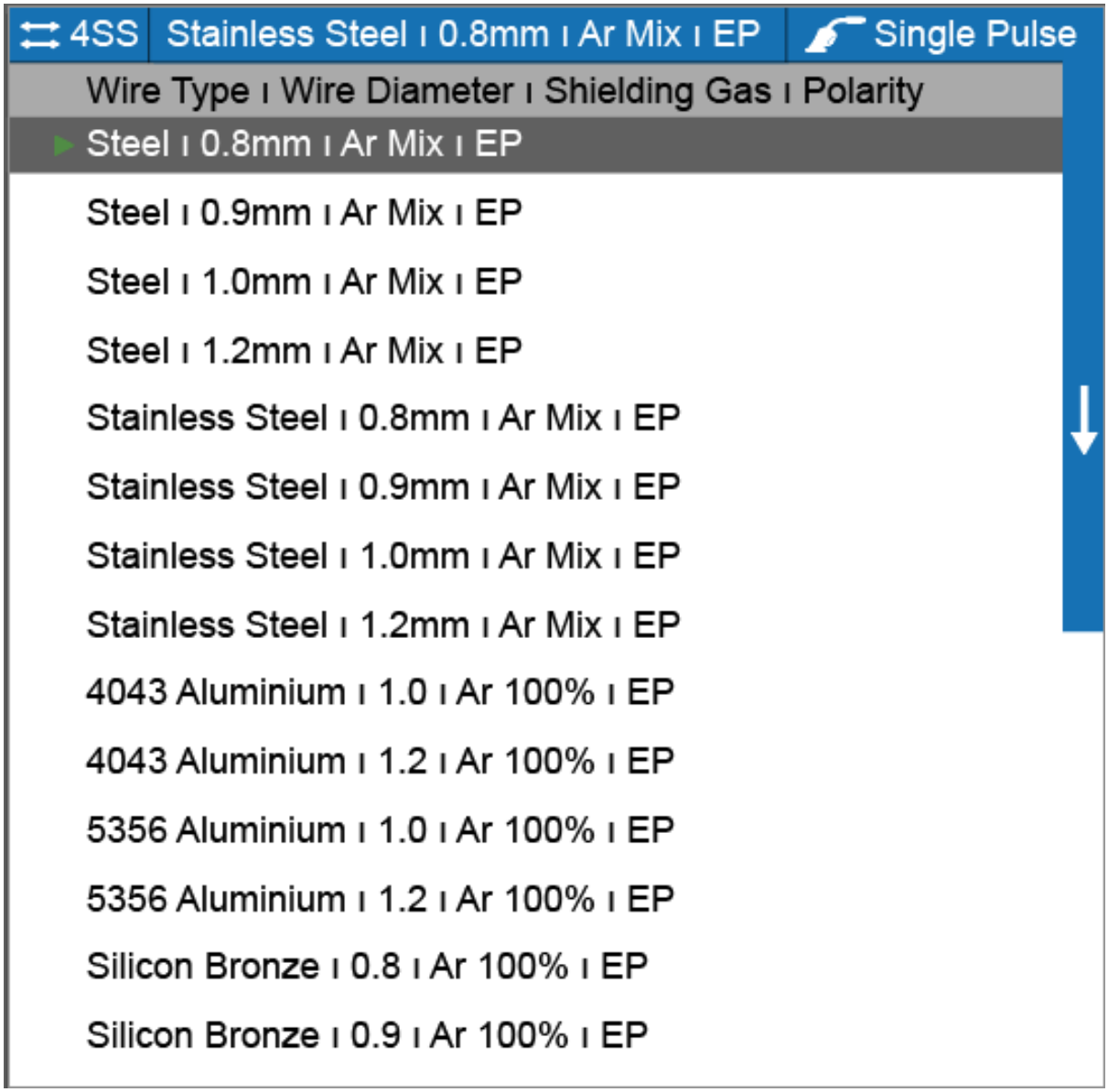
GMAW PROGRAMS (DUAL PULSE)

From the programs menu you can select all common welding wires and the machine will calculate the correct wire speed to amperage ratio along with voltage inputs.

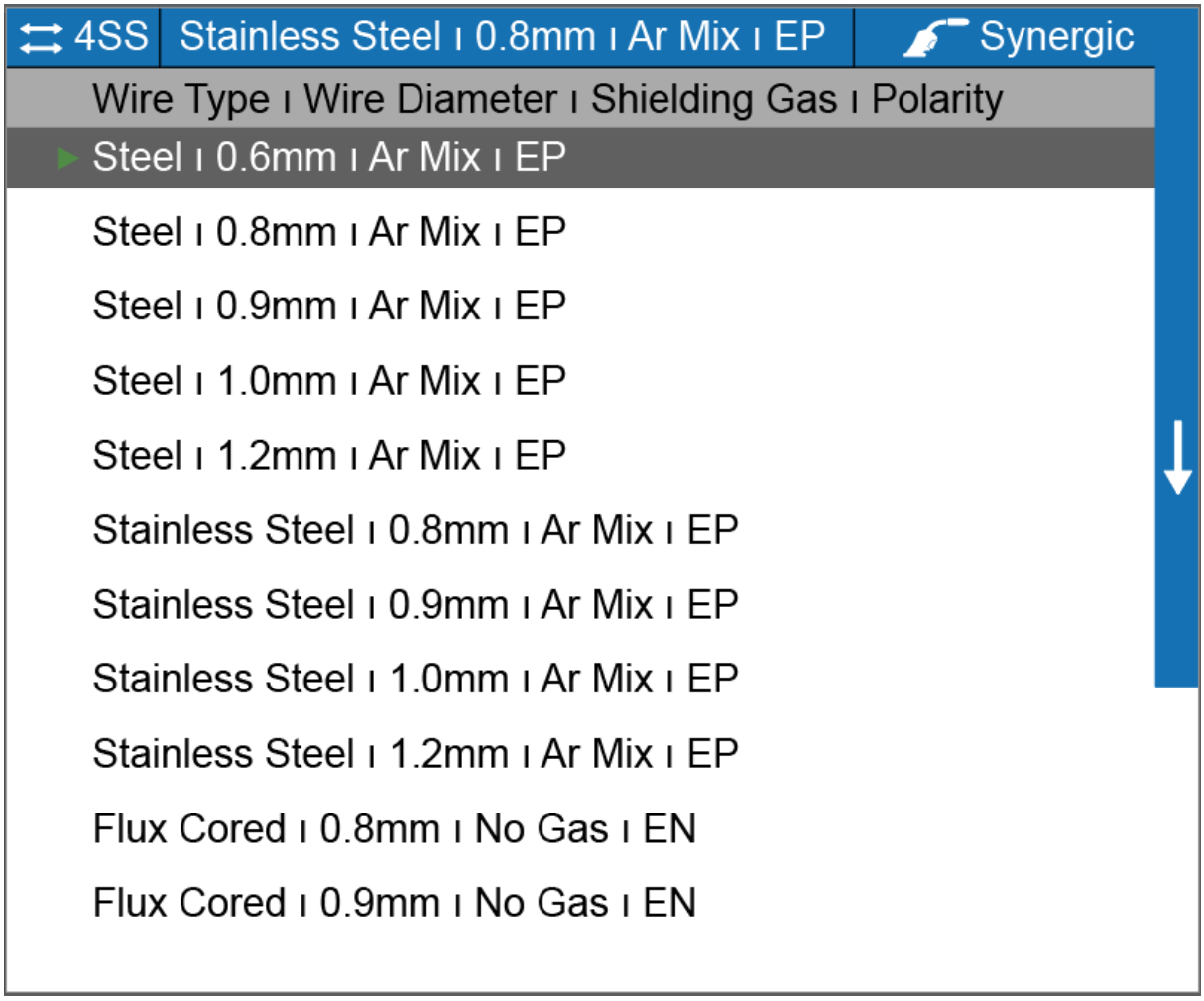


NOTE: There is different programs available for the Synergic, Single and dual pulse program modes. When in manual mode the machine works as a regular MIG with the wire feed speed to amperage ratio set at factory specifications.

GMAW PROGRAMS (SINGLE PULSE)

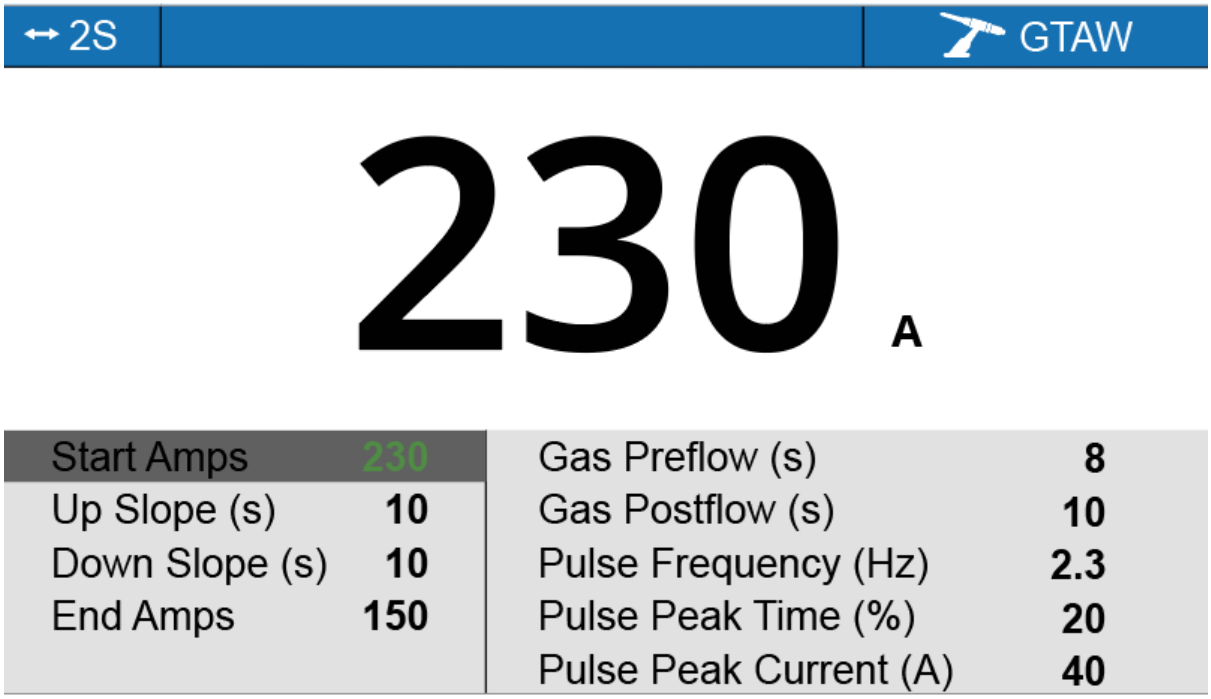


GMAW PROGRAMS (SYNERGIC)



GTAW FUNCTIONS

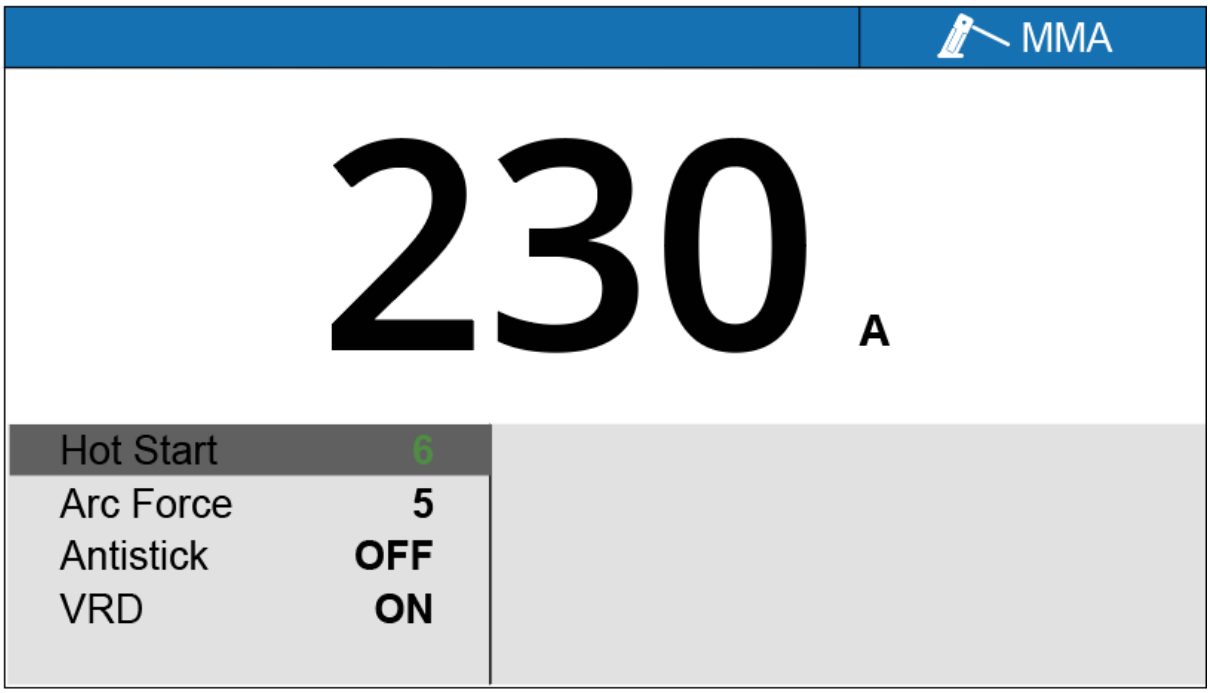
The GTAW welding mode uses lift arc to establish the arc. This is done by pressing the trigger switch then lifting the tungsten off the work piece with the torch the arc will then start.



Start Amps - Initial welding maps
Upslope - Time to the main welding amps
Down Slope - Time to the last welding amps
End Amps - Last welding amps
Gas Preflow - First gas before welding starts
Gas Post Flow - Time of gas flow after the welding stops
Pulse Frequency - Pulses Per Second at the peak amps
Pulse Peak Time - Time spent at the peak amps setting
Pulse Peak Current - Pulse peak current

MMA FUNCTIONS

The MMA welding process can be performed with this machine.



Hot Start - Increases the start current to help arc starts.
Arc Force - Temporary increase of the output current during welding when the arc is too short.
Antistick - Helps prevent rod sticking.
VRD - Reduces the output voltage to safe levels.

PULSE MIG

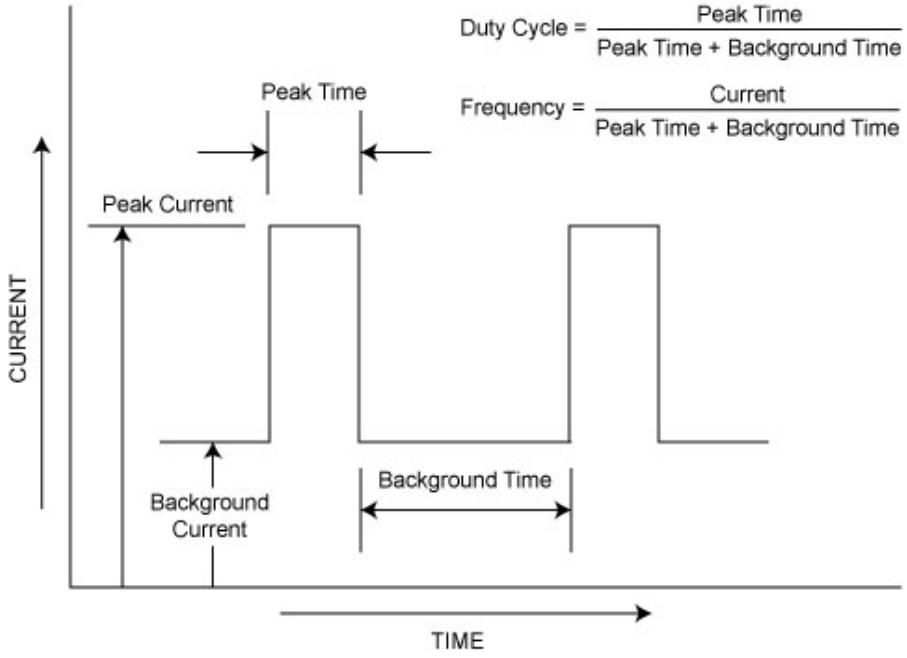
The SWS ALUMMIG 230 dual pulse MIG welder makes pulse MIG welding simple by synergically controlling the pulse with both Single and Double pulse waveforms. This means that the machine is taking care of the complicated calculations needed to create a smooth stable pulse action without the need to dial in every parameter taking out user error and reducing setup time significantly.

In the pulse-spray transfer mode, the power supply cycles between a high spray transfer current and a low background current. This allows for extra cooling of the weld pool during the background cycle, making it slightly different from a true spray transfer and has some distinct advantages.

- Works very well with Aluminium
- Can be used in all positions
- Faster travel speeds
- Less spatter
- Less heat input while maintaining good penetration

SINGLE PULSE
Single pulse mode allows the user to select the consumables type and the machine synergically sets the parameters that are best suited for the welding being performed.

DUAL PULSE
Dual pulse allows more control over the welding parameters but it is still primarily controlled synergically. The pulse frequency can be adjusted from 0.1 - 5 pulses per second (Hz). The dual pulse dynamic can be adjusted from negative 10 to plus 10 this simply effects the highs and lows of the pulse cycle.



WIRE FEEDER

The wire feeder is mainly composed of driving motor, speed reducer, wire feeding roller, pressure roller, pressure adjusting component, wire feeding joint, support frame and other components.

The welding wire enters the groove of the wire feeding roller by the wire feeding tube, and the pressing device applies appropriate pressure to the welding wire. At the same time, the driving motor drives the power to drive the wire feeding roller through the speed reducer, and feeds the welding wire into the welding torch for continuous automatic welding.

Wire Feed Roller Specifications

Groove Type	**Specification**
V Groove	0.6~0.8 0.8~1.0 1.0~1.2 (For 0.9 wires use 0.8 V Drive Roller)
U Groove	0.8~1.0 1.0~1.2 (For 0.8 and 0.9 Fluxed cored wires use 0.8 U Drive Roller)

NOTE:
1. V Type for Steel Wire
2. U Type for Aluminium Wire and Gasless Wires

Wire installation

Select the welding wire that matches the specification of the feed roller, pull the pressure adjustment handle down, the pressure roller component automatically releases, let the welding wire enter into the slot of the feed roller through the guide inlet, penetrates into the welding gun feed pipe, and then restore the pressure roller component to the original position, adjust the pressure handle knob to the optimal position, so that the feed roller consistently drives the wire forward. Only apply enough pressure to to avoid slippage. To much pressure can deform the welding wire causing feeding issues.

Wire replacement

The procedure for replacing the welding wire is basically the same as wire installation, but at first turn off the power of the welding machine, pull the pressure adjustment handle down, take out the welding wire, select the required welding wire and the matched feed roller, let the welding wire pass through the inlet guide, make sure the welding wire is inside the feed roller slot and then penetrate the torch into the wire tube, push the pressure adjustment handle up.
Since the feed roller groove will wear after using for a period of time and cause the welding wire to slip, so the pressure adjustment knob can be rotated down to 3~5

Note: The wear of the intermediate guide wire tube and the welding torch inlet can also cause the welding wire to slip, as a result the intermediate guide wire tube or the welding torch contact tip needs to be replaced when worn.

WIRE FEEDER

The matching of welding wire and feed roller
Using the wire according to the specification on both sides of the feeding roller, pay attention to the corresponding relationship of the marking and slot

Feed roller use and replacement
To prevent slippage, the protective grease should be cleaned from the feed roller.
Due to the different diameter of the welding wire, the feed roller should be exchanged frequently. When disassembling the feed roller, at first turn off the power of the welding machine, open the pressure adjustment handle, take out the welding wire, unscrew the fastening nut (screw), remove the feed roller and change to the roller needed. Note that the flat key cannot fall off, tighten the nut (screw). Then install the welding wire in the steps of replacing the welding wire.

Daily considerations
- Due to vibration, the tightening nut may loosen during use, check regularly, tighten it if it is loose.
- Do not touch the feed roller and gear with your hand when it is working.
Use in areas, not exposed to direct sunlight, rain or wind, avoid the welding slag falling into the wire feeder.
-Frequently clean the dirt and dust in the groove of the feed roller
- There should be no abnormal heating at the cable connection
- All cable joints should be well insulated

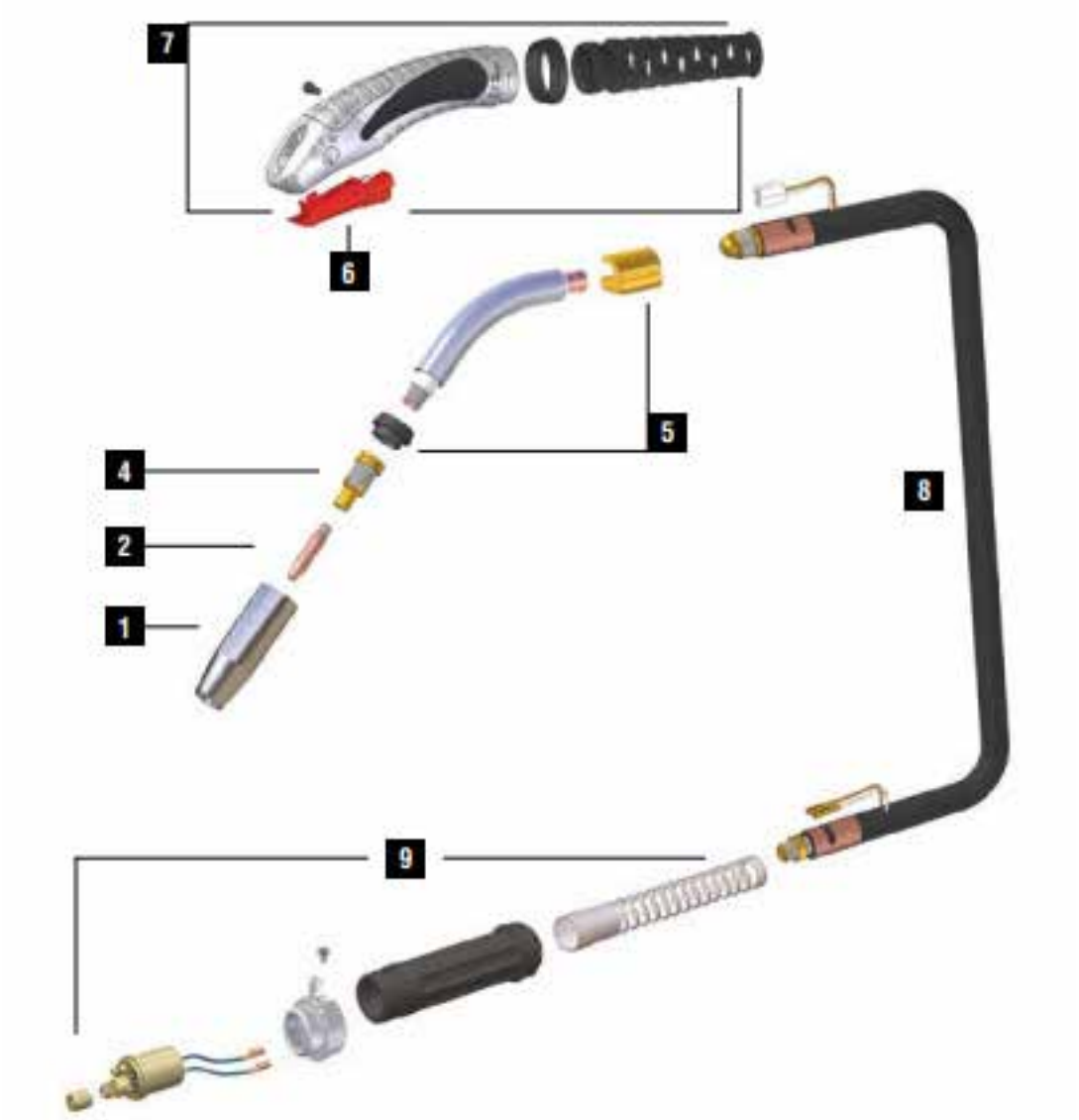
Wire feeding guides (To change unfasten the Phillips head locking screw)
FIGURE 1 - Used for soft wires such as aluminium.
FIGURE 2 - Hard wires such as steel and stainless steel.

FIGURE 1

FIGURE 2

MIG TORCH

The supplied MK 24 MIG torch is suited for up to 250 Amp is installed with a Teflon liner that can be used for all wire types from 0.8 - 1.2mm.



1. Gas Shroud
2. Contact TIP CuCrzr Hardened for Pulse Welding (0.8, 0.9, 1.0, 1.2mm)
4. Diffuser
5. Torch head holder
6. Trigger
7. Handle Assembly
8. Cable 3M is the maximum length recommended for pulse MIG welding
9. EURO Connector Assembly

PUSH PULL / SPOOL GUN

This machine is push pull gun and spool gun ready. It uses a 24V supply for the gun. Please contact SWS for adapting your gun or to see if suitable. We will have 2 models available for purchase soon that will be calibrated with the machine. (This page will be updated once available)

SWITCH PORT PIN OUT

PIN	FUNCTION
1	Torch Switch
2	Torch Switch
3	Power + of inner pull wire torch
4	Power - of inner pull wire torch
5	Power + of external pull-push wire torch
6	Power - of external pull-push wire torch

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