

Oxford MULTIMIG 2Pulse Synergic Compact & SWF 270-510A

High performance Multi-process MIG/MAG machines with pulse & double pulse.



USER INSTRUCTION MANUAL



Safety – multiple risks – please read carefully

Before using make sure all operators are familiar with the welding/cutting process and have had appropriate training relating to the risks involved.

Please visit the UK HSE sites below to understand & control the risks from welding & cutting.

<https://www.hse.gov.uk/welding/other-welding-risks.htm>

<https://www.hse.gov.uk/welding/welding-controls.htm>

<https://www.hse.gov.uk/welding/health-risks-welding.htm>

Basic safety information is summarised below.

- When welding or cutting in an environment with increased risk of electric shock extra precautions must be observed. Typical conditions with increased risk of electric shock are working in wet or damp conditions, working inside vessels, working in cramped conditions and exposed to conductive parts. You should only use welding machines marked with S for these higher risk applications. OXFORD MULTIMIG models are all marked S.
- Before use check the local area for flammable materials & ensure suitable fire extinguishers are available to hand. Do not weld near or on flammable materials or any product that may contain flammable compounds or gasses or fumes inside such as tanks & cylinders. After welding check the local area carefully for any burning or smoking materials & recheck after 30 mins or so.
- Always use correct PPE (eye and body protection) when using this machine. Recommended eye protection is with a shade 10-12 lenses, for most general work, for high power use up to shade 15. Full face protection is essential. Wear leather gloves & ensure all exposed skin has protection from burns.
- Use correct LEV (fume extraction) equipment & always avoid inhaling welding fume.
- Ensure other persons in the area have sufficient PPE from the welding arc, sparks & fumes.
- Electromagnetic fields are created by the welding process, these can be hazardous & may affect pacemakers, keep welding cables as far as possible away from your body. Do not coil cables around the body, keep cables at ground level where possible. If you have a pacemaker do not weld until you have consulted your medical adviser.
- Keep bodily parts & clothing well away from wire feed systems, fans, wire spools & other moving parts.
- If using the 4X wire feeder at height, do not rely solely upon the wire spool holder to hold the MIG wire reel safely. Take extra precautions to protect against wire spool falling.
- Only connect dedicated MIG/TIG gas to this machine, normally a mix of argon/CO₂, or pure CO₂ or pure argon.
- Gas cylinders must be treated with care, a damaged cylinder may explode. Transport cylinders safely, only use in upright position & ensure they are secured from falling.
- Never lift this machine with a gas bottle attached.
- Before mounting a gas cylinder to this machine check the wheels/axles & undercarriage are in perfect condition & no parts are missing.
- Only use & move this machine on a flat stable surface, take extra care is a gas cylinder is attached, the extra height & weight of a cylinder can cause instability.
- Only use this machine for ARC welding, MIG/MAG or TIG welding, it is not designed for any other use.
- This machine is rated to IP23S so may be used indoors or outside, if used outside it must be protected from water & excess damp.
- Do not use in a wet environment, this machine & torch should be kept dry.
- Do not use this machine with side panels missing or other parts missing or damaged.

Further information on the safe use of welding & cutting machines can be found in IEC60974-9

A documented risk assessment should be carried out prior to installation & use of this machine.

Declaration of conformity

MULTIMIG 2Pulse models 270A-510A 230V & 400V are manufactured to comply with;

Low voltage directive 2014/35/EU
EMC directive 2014/30/EU
Eco design directive 2009/125/EC (EU2019/1784)
RoHS directive 2011/65/EU

In accordance with the following standards & regulations.

IEC60974-1
IEC60974-5
IEC60974-10
EU2019/1784
IEC61000-3-12



Date 15/05/2025

R P Rycroft *R Rycroft* Managing Director Technical Arc Ltd York UK. www.tecarc.com

Pre installation & EMC information

This is 'Class A' equipment & is designed for use in industrial premises, not for use on domestic electrical supplies. If used in other environments there could be potential difficulties with electromagnetic interference. It is the user's responsibility to ensure that if any electromagnetic disturbances are detected to resolve this before continuing.

The installer of this equipment should make an assessment of the area before installing.

For all welding machines it is preferable to use as far away as possible from sensitive electrical or electronic equipment such as computers, telecom equipment, safety critical equipment, transmitters and receiving equipment etc.

There is a risk to sensitive equipment from radiated or conducted emissions from this machine.

Consideration must be also given to other premises as the emissions may not be limited to the installed premises.

The following are methods to reduce emissions.

- 1) Keep all welding cables short close together and at ground level.
- 2) Equipotential bonding of metal components in the work area and bonding of the work piece can be considered however there are electrical safety implications for the operator with increased risk of shock if the electrode is touched; therefore it is important the operator is aware and adequately protected from making contact with the work and the electrode. **Before bonding the area and work piece consult an experienced electrician & refer to IEC60974-9.**
- 3) This equipment must be properly maintained and all screws holding the sides etc kept in place.
- 4) Sometimes it may be necessary to fit additional mains input filters or even screen the cables and / or work area. This will involve consulting an experienced engineer or contact OXFORD WELDERS directly.

Oxford MULTIMIG 2Pulse models comply with IEC61000-3-12 if the input main supply has a short circuit power (Ssc) equal or greater than that specified in the technical specifications. (Measured at the point of entry from the public supply network to the users incoming supply point).

Overview of your MULTIMIG 2Pulse Synergic

OXFORD MULTIMIG's are all heavy duty Industrial machines designed to give a minimum 25 year lifespan. Simple to use machines with better welding performance than traditional transformer MIG! Low spatter, instant arc starts & infinite weld control +/- 1A & 0.1V. Real performance benefits but easier to set & use than our old transformer machines. Weld anything from the thinnest car panels up to structural steel buildings & large earth moving equipment for the biggest models.

All models have 4 roll MIG wire drive, with MMA ARC welding & DC TIG functions included.

2Pulse models provide the same superior welding performance on standard MIG as our popular CS models but with the addition of synergic control & pulse MIG welding.

'No nonsense' simple to set & simple to use pulse MIG provides spatter free welding of all materials. Main benefits are seen on aluminium where TIG like welds can be produced with ease. Much faster & easier than TIG, great for aluminium frames, trailers, sheet etc.

The power source is made using 2 high power IGBT modules in a H bridge design & simple electronics for maximum reliability & easy serviceability. Unlike other inverter welding sets OXFORD MULTIMIG models are relatively unaffected by harsh operating or storage conditions. They contain no microprocessors or programable technology just reliable power electronics & controls. Happy to weld all day long 7 days a week in industry or be stored in a barn for years & rolled out for use when needed.

Fan cooling runs as needed to minimise wear, power consumption & dust ingress (on demand cooling).

Water cooling can be specified for the highest demanding applications. This also runs as needed to reduce power consumption & minimise wear on the pump. Water cooling can be used for both MIG & TIG.

MULTIMIG models have very high efficiency to comply with the latest ECODESIGN regulations. This means we can provide more output power from a lower input supply.

MULTIMIG 2Pulse models are both compact & SWF MIG rolled into one unit. Simply plug in our 4X wire feeder & you have SWF MIG! - maximum flexibility. You to have both a workshop machine & a site machine rolled into one. Or have one wire feed set up for aluminium & the other set up for steel etc.

Plug in our TIG torch to give true lift TIG with switched gas & power control & adjustable start current & gas post flow control.

Plug in an electrode holder for MMA ARC welding, super smooth arc & fast starts.

Plug in our SG spool guns for great aluminium MIG welding at distance, trailer bodies etc.

Technical specifications

Model	271	331	411	273	333	413	513
Input voltage	230V 1 ph	230V 1 ph	230V 1ph	400V 3 ph	400V 3ph	400V 3ph	400V 3ph
Recommended fuse - slow D type *	25A (16A)	32A (25A)	45 (32A)	16A	16A	20A (16A)	32A (25A)
Minimum ** generator KVA	5.5KVA	7KVA	10KVA	5.5KVA	6.5KVA	9KVA	14KVA
I eff current	21A	31A	47A	7A	11A	16A	23A
Output range CV (MIG)	20A@15V - 270A@27V	20A@15V- 330A@30V	20A@15V- 410A@34.5V	20A@15V - 270A@27V	20A@15V- 330A@30V	20A@15V- 410A@34.5V	30A@15V- 510A@39V
Recommended MIG wire sizes	0.6-1.0mm	0.6-1.2mm	0.6-1.2mm	0.6-1.0mm	0.6-1.2mm	0.6-1.2mm	0.6-1.6mm
Amps range CC (MMA/TIG)	15A-270A	15A-330A	20A-410A	15A-270A	15A-330A	20A-410A	20A-510A
OCV – no load	68V DC	68V DC	70V DC	68V DC	68V DC	70V DC	70V DC
Duty cycle max out @ 40°C	270A@35%	330A@40%	410A@45%	270A@35%	330A@40%	410A@45%	510@45%
Duty cycle 60%	205A	260A	355A	205A	260A	355A	450A
Duty – 100% continuous	160A	205A	275A	160A	205A	275A	350A
Ssc P ***	1240KVA	1380KVA	1900KVA	2100KVA	2640KVA	3280KVA	4400KVA
Idle power	12W	12W	12W	16W	16W	16W	16W
Power factor	0.81	0.80	0.81	0.94	0.94	0.95	0.95
Efficiency	84%	84%	84%	85%	85%	86%	86%

* Input fuse size is a result of our calculations & tests, it is possible to use any of these models on a lower fuse size at lower welding power. We recommend always using a 'D' type circuit breaker (slow acting) to avoid intermittent tripping, in some instances you may experience intermittent tripping if using close to maximum output or welding for extended periods at very high power.

** Min KVA rating quoted is for up to 3/4 power output, to achieve max output we suggest increase KVA by 40%-50%.

*** This equipment meets the requirements of IEC61000-3-12 if the short circuit input power (Ssc) is equal or greater than the value specified above. It is the installers or users responsibility to ensure that the input power is suitable for this equipment.

Duty cycle notes: The values specified above are based on MIG welding to the V/A relationship specified in BS IEC60974-14. MMA values are approximately 2-5% lower than above due to higher on load voltage. TIG welding duty cycle values are approximately 4% higher than specified above due to lower on load voltages. All duty cycles are tested at 40°C, therefore higher values can be achieved when operating at lower temperature.

Unpacking & assembling the machine

Unpacking - Check the packaging for any signs of damage. Carefully remove the machine and retain the packaging until the installation is complete.

For transportation, the wheels and bottle tray are not fitted to help prevent damage and make transporting easier. Use the M8 hex bolts, washers and nuts in the clear bag to fix the bottle tray onto the back of the power source. Make sure all the bolts are used and tightened up, and that the bottle tray is secure. The axle is already fixed to the bottle tray and ready for the wheels to be fitted. Fit a large washer that are in the clear bag on the axle first then the wheel and then another large washer next to the wheel. Use the cotter pin to slot through the hole in the axle to secure the wheels on in place.

The front castors are secured onto the machine using two M8 hex bolts onto the outrigger and two M8 hex bolts into the captive nuts under the machine for each castor. Lift the front of the machine and prop it up high enough to get the castors bolted in. Make sure the machine is propped up safely before unscrewing out the two M8 hex bolts from the captive nuts for each castor. Fix the castors in place using all four M8 bolts and fully tighten.

Always ensure all wheels & castors are securely fitted before mounting a gas bottle to this machine.

Notes for positioning the machine: Make sure there is adequate clearance at the front and rear of the machine to allow good air flow to circulate through the machine. Ensure that the machine is positioned in such a way to avoid particles created by grinding or cutting operations entering the machine.

Electrical Installation

This machine must be connected to the electricity supply by a competent person

Connecting to mains supply

Make sure that the mains supply is of the correct voltage and current capability for the machine.

Ensure that any extension cables used are of sufficient current carrying capacity.

Ensure that the mains plug fitted (and socket if fitted) are in good condition and they are the correct current carrying capacity.

NOTE! Cables should be rated based on the I_{eff} value of current shown in the technical specifications.

Do not connect this machine to any voltage other than what is stated on the spec plate and marked on the rear of the machine.

- **230V single phase models**

Make sure your supply voltage matches the voltage model of the Machine. Ensure the green/yellow wire is connected to the earth terminal in the mains plug the other two wires are normally blue and brown wires which must be connected to the appropriate voltage, the blue is neutral and the brown is live, in some instances the colours of the live & Neutral may be both black, in which case it is not important which way around they are connected but the green/yellow wire must always be connected to the earth terminal in the plug.

- **400V three phase models**

Make sure your supply voltage matches the voltage model of the Machine. Ensure the green/yellow wire is connected to the earth terminal in the mains plug.

The other three wires are normally coloured or can be all black, these connect to R, S, T or L1, L2, L3 in the plug in any order. If the plug is a 5 pin type, do not connect the N or neutral to anything. These machines do not need a neutral supply.

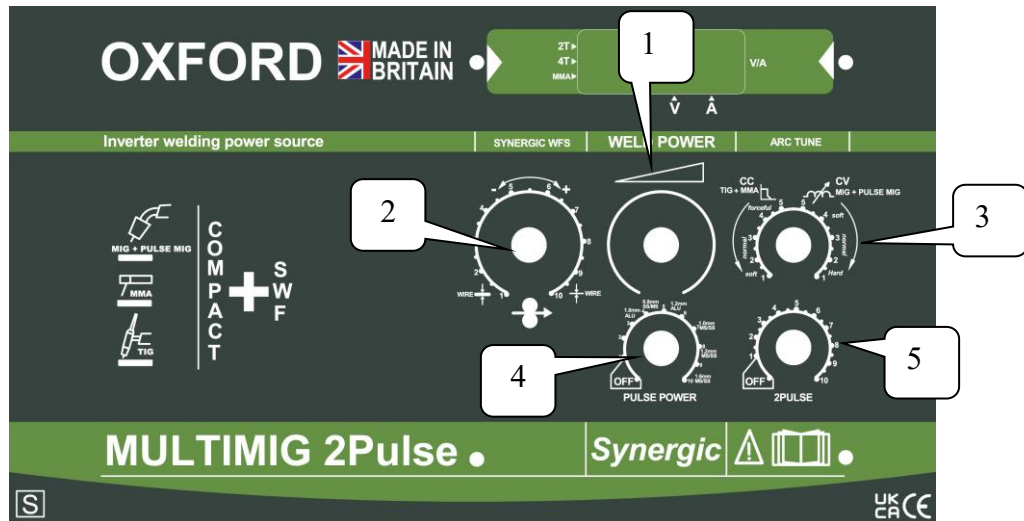
If in doubt consult a qualified electrician.

Front panel connections & digital display controls



1. **Euro torch connector** – Connection for Mig torch.
2. **Welding positive Dix connector** – Connection for positive welding output. For standard MIG welding, plug the Dix plug from the torch into the positive dix socket. For welding reverse polarity with flux cored wire etc, connect the Dix plug from the torch into the negative and the earth return lead into the positive Dix socket. In MMA mode the electrode lead plugs into the positive Dix connector for standard electrodes or the earth return lead plugs in for reverse polarity.
3. **Welding Negative Dix connector** – Connection for Negative welding output. For standard MIG welding, the welding earth cable connects to negative socket. For welding reverse polarity with flux cored wire etc, connect the plug from the torch into the negative and the earth return lead into the positive Dix socket. In MMA mode the welding return lead plugs into the welding negative Dix socket for standard electrodes or the MMA lead plug into it for welding reverse polarity.
4. **Gas connection** – This connector is for the gas output. For compact mig use, connect the hose from the euro connector. For use with a separate wire feed unit plug the interconnection lead gas hose into the front gas connection. (Note: To remove the gas hose connector, press in the outer plastic ring & withdraw the hose fitting).
5. **Remote connector** – This connector is used to connect the Oxford 4X separate wire feed unit, Oxford spool on gun or for a switched TIG torch.
6. **Mode button** - This push button enables the operator to select between MMA, 2T or 4T mode. 2T mode is welding with finger on the torch trigger all the time (Normal trigger mode). 4T (latch mode), the operator presses and releases the torch trigger and it will keep on welding until you press and release the torch trigger again. 2T & 4T mode can be used for both MIG & TIG welding. In addition 4Tlo function is standard on 2Pulse models, select 4T, press & hold & arc will start at low value, release for set value, press & hold for low value, release to stop weld. This feature works for all welding, ideal for controlled arc starts & crater filling end of weld. MMA mode switches the machine output to live all the time, for MMA welding.
7. **Display** – The LED readout displays the real amperage and voltage whilst welding. When not welding the readout displays a preset value. The preset value of volts or amps is an approximate value. The values of preset volts are most accurate when the Arc Tune dial is set mostly clockwise for MIG/MAG welding. The value of preset amps is most accurate when the Arc Tune dial is set fully anti clockwise in CC mode for MMA/ TIG welding.
The display can be calibrated if needed for welding compliance with EN1090 etc
8. **Display A/V button** – This button allows the operator to select the display of amps or volts.

Front panel controls



1. **Weld Power control – (simple one knob control of all welding)** This dial is used to set the welding power. For MIG welding (CV) & pulse MIG it sets the welding voltage & overall output power. In MMA & TIG welding (CC) this sets the welding current. It gives full linear control from minimum to maximum output power for all welding.
Adjustment of the weld power is normally all that's needed once other controls are set.
2. **Synergic wire feed speed control** - This machine has synergic control of the wire feed speed in all MIG & pulse MIG welding. The speed of the wire feed adjusts automatically to suit the weld power. This speed control knob should be adjusted initially to suit the wire size & material type. Further adjustment of this is not normally needed but it can be adjusted for any fine tuning of arc length as needed. Furthermore, these models have no restriction on the wire feed speed range, therefore the operator has complete control over this for any special applications as needed.
3. **ARC TUNE** – This dial enables the operator to adjust the arc condition. In MIG (CV) welding mode 1- 5 (clockwise side) adjusts the inductance of the weld. 1 being least inductance to 5 being max inductance. For most MIG welding 2-3 setting is ideal. For Pulse MIG welding the effect is similar to standard MIG, in addition by turning this control anticlockwise a little it increases the pulse base current to provide a softer more fluid like pulse condition. For pulse MIG recommend setting around CV – 3. For MMA & TIG welding (CC 1 – 5 (anticlockwise side of the dial) adjusts the amount of Arc force. 1 being no arc force to 5 being max arc force. The ARC TUNE control is an important function & has a profound impact on welding. For instance, on MIG a softer setting can almost eliminate spatter. Setting this control fully anti clockwise is true CC (soft MMA & TIG). Fully clockwise is true CV (hard & fast MIG). Around half way is 50% CC, 50% CV, this is a very soft MIG arc or a hard biting MMA / TIG arc. Settings close to 50% are rarely used.
4. **Pulse power** – Fully anticlockwise setting is no pulse (for all standard MIG welding). Pulse power control sets the peak current during all pulse MIG welding. For light gauge wire 0.8, & softer wire like aluminium lower pulse power is needed. Harder & large diameter wires such as 1.2mm Stainless & mild steel need more pulse power. The dial provides approx. indication of the wire size & type. Its simple to set this control, once set no adjustment is needed unless you change the wire type or diameter.
5. **2Pulse** – Fully anticlockwise is OFF (standard pulse MIG) turning the control clockwise starts double pulsing. Fully clockwise is maximum double pulse frequency. Double pulsing provides alternating weld power from the set value to a low value, this allows the weld pool to cool a little during the low period. Ideal for creating the 'stack of cards' TIG like weld appearance on aluminium. Also good for vertical up welding & other tricky jobs where too much heat build up needs to be avoided.
In addition, 2Pulse also operates in CC mode & can be used for pulsed TIG welding.

Fitting the MIG welding wire & torch

MULTIMIG models are all fitted with the industry standard EURO connector so almost any common MIG torch can be fitted. We stock 3M, 4M & 5M lengths in various amperage ratings. A water cooled torch can also be fitted if your model has water cooling built in.

Ensure the welding torch is fitted tightly to the Euro connector on the front of the machine or wire feed unit.

Risk of crush damage to fingers etc, from wire feed rollers & gears, switch machine to off before touching wire drive mechanism, & keep guard in place.

Inside the door on the left hand side is the wire drive compartment. The powerful 4 roll drive system is capable of pushing 1.6mm welding wires all day long. We fit the same drive system in all models.

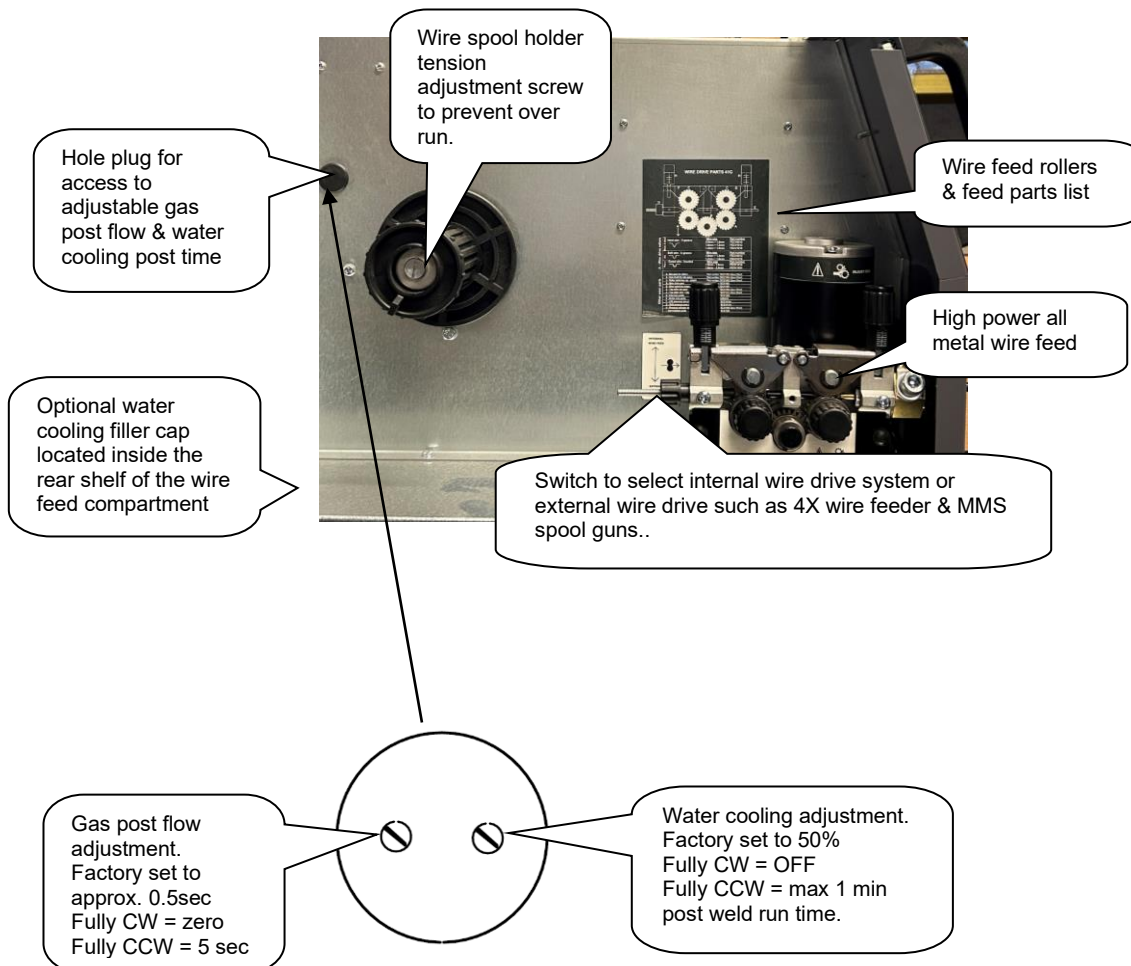
Always use good quality, clean, rust free wire.

Firstly, check that the size of groove in the wire feed roller matches the size of the wire being used. The roller has two different size grooves which can be removed & changed around.

Fit the wire reel onto the spool holder & secure with the plastic nut, make sure that the end of the wire is perfectly straight, then push the tension levers to a side & manually feed the wire through the inlet guide, over the groove of the rollers and through small hole in the brass guide tube until the wire appears out at the front of the machine a few centimeters. Place the wire tensioning arms back into position & set the pressure device so that the wire feeds through the torch without slipping but if the wire hits the workpiece without arcing it then slips on the roller.

The wire spool holder has a tension screw or nut in the middle which can be adjusted to make sure that the wire spool does not run on at the end of a weld. If it overruns the wire may fall off the spool rim, resulting in tangles & incorrect feeding.

Inside the MULTIMIG wire feed compartment



Optional separate wire feed unit & inter connection lead

The power source has the option to plug in the MULTIMIG 4X separate wire feed unit & inter-connection lead.

The length of the inter connection lead is 5M as standard with the option of longer inter-connection leads up to 20M.

The 4X wire feed unit can be used on top of the power source or used to extend the reach. Ideal for taking to more inaccessible jobs such as trailers or working at height, or fitting to a boom arm etc.

No controls or functions are fitted on the wire feed unit. This reduces the size & weight of the wire feeder & improves ruggedness & reliability. All welding parameters are set via the controls on the power source.

The MULTIMIG 4X wire feeder lead plugs into the connections on the front of the power source using the interconnection cables supplied, always make sure connections they are tightly connected & secure.

Optional castors & a swivel kit can be specified for the wire feeder, the castors mount under the feeder to allows easy movability on workshop floor. The swivel kit comprises of a male post & steel plate which fits on top of the power source lid, a female part with insulation fits to the underside of the 4X wire feeder. This allows the feeder to mount securely on top of the power source with 360 degree swivel of the wire feeder.

MULTIMIG 2Pulse models have the option of remote weld power added to the 4X allowing full control of the welding power from the wire feeder.



Optional water cooling

The optional water cooling is a super quiet 'on demand' system which runs automatically when welding & continues for a while to cool the torch. MULTIMIG water cooling provides class leading energy efficiency with zero energy on standby & less than 100W of power during welding. (conventional water coolers typically consume 400-1000W constantly).

Cooling capacity is rated at 1000W for a 22°C rise above ambient temperature, flow rates typically 2L/min through welding torch & is therefore suitable for all known water cooled MIG & TIG torches up to 500A.

Built in flow protection circuitry is fitted to protect your welding torch. If flow return from the welding torch is not detected the machine shut down after a short time. In this instance the digital display will show 'F' (Fault). Water cooling can be used for MIG or TIG welding torches.

The cooling post run time depends on the welding time, but can also be adjusted if needed. Behind the wire spool in the wire feed compartment a 20mm black hole plug can be removed to allow screwdriver adjustment of this time. (adjustment point is shown on the previous picture). This can also switch off water cooling if required. The coolant capacity is approximately 2L. Your OXFORD will be supplied from new with SACIT coolant in the tank to approximately 50% level. Don't mix other coolants with this. SACIT coolant protects down to -20°C, it also lubricates the pump & other parts & provides corrosion protection to the welding torch & internal parts. It is possible to top up with up to 1L of pure deionised water (same product used for automotive batteries). This will reduce freeze protection to around -7°C.

The coolant should be changed every 24 months or sooner for high production use.

If the coolant freezes the heat exchanger & pump may be damaged & will require replacement parts fitting, so its well worth ensuring the coolant quality is maintained.

We recommend using SACIT coolant neat in your OXFORD machine.

See accessories page for part number.

MIG welding with this machine

These models provide outstanding MIG welding performance on steel stainless & duplex steels & aluminium, much improved over conventional transformer based machines.

In addition Pulse & 2Pulse MIG welding provides additional spatter free welding & weld appearance benefits.

Standard synergic MIG - With the machine all set up ready to MIG weld, the operator should first set the welding power required to suit the thickness and type of weld to be carried out. As the welding power knob (dial 1) is adjusted the welding voltage set value is shown in the LED display. A little trial and error is required when first setting the welding power. It's generally better to start with a lowish voltage setting and increase if needed.

Next set the wire feed speed (dial 2) to suit the wire size & type being used. Large diameter wire like 1.2 will normally be at the lower end of the dial, thin wire 0.8mm towards the top end of the dial.

You should start initially with some scrap metal, the welding torch should be held over the material so that the copper contact tip is around 5mm away from the job and at around 45° to the job. Its acceptable to rest the outer edge of the welding nozzle onto the job just angle the torch back to give 5mm ish between the tip & the work. Make sure your eyes are protected by the welding mask, then press the torch switch and attempt to weld watching through the lens of the mask. As soon as a stable arc is created pull the torch away from the job slightly & move the torch steadily to create the required weld position & profile.

For welding at currents below 250A (dip transfer) a good arc condition is achieved when a consistent buzz or crackle is heard from the arc. If the arc is very bright and trying to burn back to the contact tip, (arc length too long) increase the wire speed a little, if the arc is stubbing out or pulsing or if the wire is trying to push the torch away from the job, reduce the wire speed. Once wire speed is set it should not need further adjustment unless fine tuning needed.

2Pulse synergic models have no limitation on the control of the wire speed so the operator can achieve any condition needed for any application.

To finish a weld simply release the torch switch but keep the torch in place for a fraction of a second, this allows the wire to burn back from the arc a little. If you pull away the torch too quickly then the welding wire may have too long a stick out from the torch each time. This machine has a burn back control fitted internally to stop the wire fractionally before the welding arc finishes to achieve the correct wire stick out. This can be adjusted on an internal trimming preset if needed.

The direction of travel affects the weld a little, pulling the torch tends to create a narrower more prominent weld. Whilst pushing the torch gives a wider more penetrating weld.

Some specialist MIG applications may require a little greater gas post flow as the end of welding. An adjustable control is accessed behind the wire spool inside the feed compartment. Remove the 20mm diameter black hole bung to allow screwdriver adjustment of gas post flow time, (see page 8).

Pulse MIG – *Pulse MIG on the OXFORD is incredibly simple to set & use yet provides infinite adjustment of pulse parameters not possible with most power sources, allowing any special wires or materials to be tackled.*

When you are familiar with standard synergic MIG operation & you have controls 1, 2 & 3 set to archive good welding conditions. Turn the pulse power control onto a suitable value (dial 4), reduce the wire feed speed around 20% & weld. A lower value of wire speed is used on pulse MIG. Adjust the wire speed so the arc is still short but creates no spatter. Reduce speed if spatter occurs. If the arc is too long increase the speed a little.

Adjust the pulse power if needed (dial 4), too high will be a harsh sounding pulse, too low & the wire droplets will not transfer into the weld pool correctly.

Adjust the ARC TUNE (dial 3) if needed. A setting of around 3 (on CV clockwise portion) normally is ideal. Setting this too low (1-2) may result in a coarse weld, too high 4 or more & the arc may not start well or the wire may stub into the weld pool during welding.

MIG welding basics

The normal process of MIG welding involves an electric arc, a consumable wire and a shielding gas.

The electrical arc creates the heat which melts both the welding wire and the material being welded, the result is a weld pool which is protected from the atmosphere by the shielding gas, or by flux if using a special gas-less wire. Without the shielding gas oxygen, other gases would contaminate the weld pool to create a weak porous unusable weld.

The welding current used for MIG welding is DC (direct current).

The output characteristics of most MIG welding machines is of the constant voltage type (CV). Therefore, when the voltage has been selected on the machine its value remains fairly constant, only dropping a little with increasing current draw.

For the vast majority of MIG welding the electrode (wire) is positive potential with the work being negative. MIG welding below 250A is normally carried out in dip transfer mode this means that the wire is constantly dipping into the welding pool & burning back which creates a stable crackle or buzzing sound if set up correctly. MIG welding above 250A is done in spray transfer mode, where the wire constantly burns off into the weld pool without constantly dipping into the pool. This results in a more stable quiet arc.

Every machine has a certain level of inductance in its output circuit. This inductance greatly affects the welding performance of the machine when welding in dip transfer mode below 250A. Too high a value would result in a hot unstable arc, too low a value would give rise to excess splatter and a cold poorly penetrating weld.

The amount of inductance on this machine can be varied using the ARC TUNE control. The higher the weld power, generally the more inductance is required. By varying the inductance, the amount of splatter produced in the weld can be reduced to a minimum to give a nice clean weld.

The welding voltage selection on all models of machines is the main control of the actual heat input into the welding pool, the higher the volts the more power.

MIG welding voltage range is from 14v to 44v.

The wire speed control and the wire size selected both affect the actual value of welding current achieved at a given welding voltage.

Gas

The choice of gas depends upon the material being welded. For mild steel & general purpose welding Argon with co2 content between 5% and 20% gives the best results. Pure co2 can be used however it gives a cold and splattering weld and is not so nice to use, pure argon results in an arc which is flary & too hot for mild steel. For stainless steels and aluminium welding pure argon is normally used, however some specialist gases such as helium / argon mixtures are available for special applications, consult your local gas specialist for further information.

The correct gas flow is essential, too little flow can result in a porous weak weld, too much and the arc can become unstable and harsh.

The gas flow should be set on the regulator to suit the welding conditions; higher welding current needs a higher gas flow, the correct flow rates are between 2-25 litres per min. Start with a very low flow rate, as a guide you should be able to only just hear the gas flowing from the nozzle when pulling the torch switch.

Never try to use a gas not intended for MIG welding

MIG wire

The MIG welding wire used is generally selected to be very similar to the material being welded, for instance to weld stainless steel you would not use a mild steel wire etc.

The diameter of MIG welding wire should be selected according to the power and thickness of material being welded. 0.8mm wire is the smallest recommended size & is suitable for between 30 and 180amps for automotive & light fabrication or maintenance. 0.6mm wire can be used for the very thinnest jobs, but generally 0.8mm is Ok for almost all light to medium welding.

1.0mm wire covers the range from about 80amps to 250amps (repairs + medium fabrication).

1.2mm is suitable from 250amps to 450amps (heavy fabrication).

1.6mm & 2.4mm are for the very heaviest fabrication applications above 350amps.

The above sizes and current ranges are approximate only, as many other factors need to be considered such as the gas used, the material being welded etc.

Always keep the MIG wire dry & rust free, do not use if the wire is rusty

Optional MMS240 & MMS360 spool guns

MULTIMIG models are ready to accept our MMS240 & MMS360 MIG spool on gun torches.

The MMS240 is rated for up to 240A & uses standard BZL 24 consumables. This gun is best suited for light to medium welding up to 6mm thickness aluminum.

The MMS360 is rated up to 360A & uses standard BZL 36 consumables & is capable of everything from thin sheet right up to heavy repair & fabrication work such as industrial tipper bodies.

Both spool guns have a 8M cable as standard, we can also supply 12M or other lengths on request.

Welding aluminum with our spool guns provides superior performance. Having the wire spool so close to the welding point eliminates the feeding issues associated with normal MIG torches & the 8M cable provides an extended reach for any application. Works great for welding aluminum trailers & bodies etc .

Set the machine up exactly as for any normal MIG application & plug in the spool gun where the 4X wire feeder normally connects. Also very good for welding steel & stainless steel in hard to access locations.



TIG welding with this machine

MULTIMIG models provide true LIFT TIG control for great arc starts & finishes. Welding performance is superb on all steels, stainless steel, copper, brass. Aluminum up to around 2-3mm also welds superbly using + electrode, but a larger diameter tungsten electrode is needed & a minimum of a WP26 torch, ideally use a water cooled WP18 torch.

For most TIG welding we recommend using our WP17 or WP26 torch fitted with MULTIMIG connections. The torch is available in 4M or 8M lengths. If your MULTIMIG has water cooling built in you can also use our water cooled torches such as WP18 or WP20.

Normally pure argon gas should be used, other gasses may be used but consult your gas supplier first. Correct flow rates are between 2-12 litres per min, for TIG welding at low power, better control of the gas flow is possible if an additional gas flow meter is fitted.

Connect the TIG torch & select the torch polarity, normally the torch is negative for steel & stainless steel etc. Swap the polarity if wanting to weld thin aluminum. Set the torch up with the correct consumables to suit your application. A sharp point on the electrode is needed to give perfect starts & arc stability when using electrode negative.

Select 2T & turn the Arc tune (dial 3) control fully anticlockwise for full CC output.

Check & set the gas flow using the button switch on your TIG torch.

Select an appropriate amperage, starting low if unsure.

To start welding the torch electrode should be in contact with the job, press the torch switch & the welding current will start at a low value, as you lift the torch away from the work the current will increase to the set value. Releasing the torch switch stops the arc. The gas continues briefly if set up for MIG, to increase gas post flow there are two options. 1) Fast double trigger the torch switch & release when you wish. 2) Adjust the gas post flow time to suit TIG, this adjustable control is accessed behind the wire spool inside the feed compartment. A 20mm dia hole bung is removed to allow small screwdriver adjustment of gas post flow time up to over 5 seconds if needed.

During the start up phase of LIFT TIG the starting current can be increased by turning the ARC TUNE clockwise a little. This can be beneficial for heavier electrodes such as used for welding aluminum with torch polarity +.

4Tlo function can also be used on TIG. select 4T, press & hold during start phase, arc will start at low value, release for set value, press & hold for low value, release to stop weld. Ideal for controlled arc starts & crater filling end of weld.

**Air cooled & water cooled
TIG torches available – see
accessories page 13**



MMA arc welding with this machine

MULTIMIG models provide super smooth MMA ARC welding with built in hot start, anti-stick function & adjustable arc force.

Plug in the electrode lead to desired polarity & the work lead to opposite polarity.

Turn the ARC TUNE (dial 3) control fully anticlockwise for the softest CC welding output, select the desired welding current & press the select switch to MMA.

During welding if the electrode sticks down the current will reduce to allow easier freeing off. This anti-stick function low current value is increased as the ARC TUNE is turned clockwise.

Adjusting the ARC TUNE more clockwise will also increase the arc force to give a more biting forceful arc.

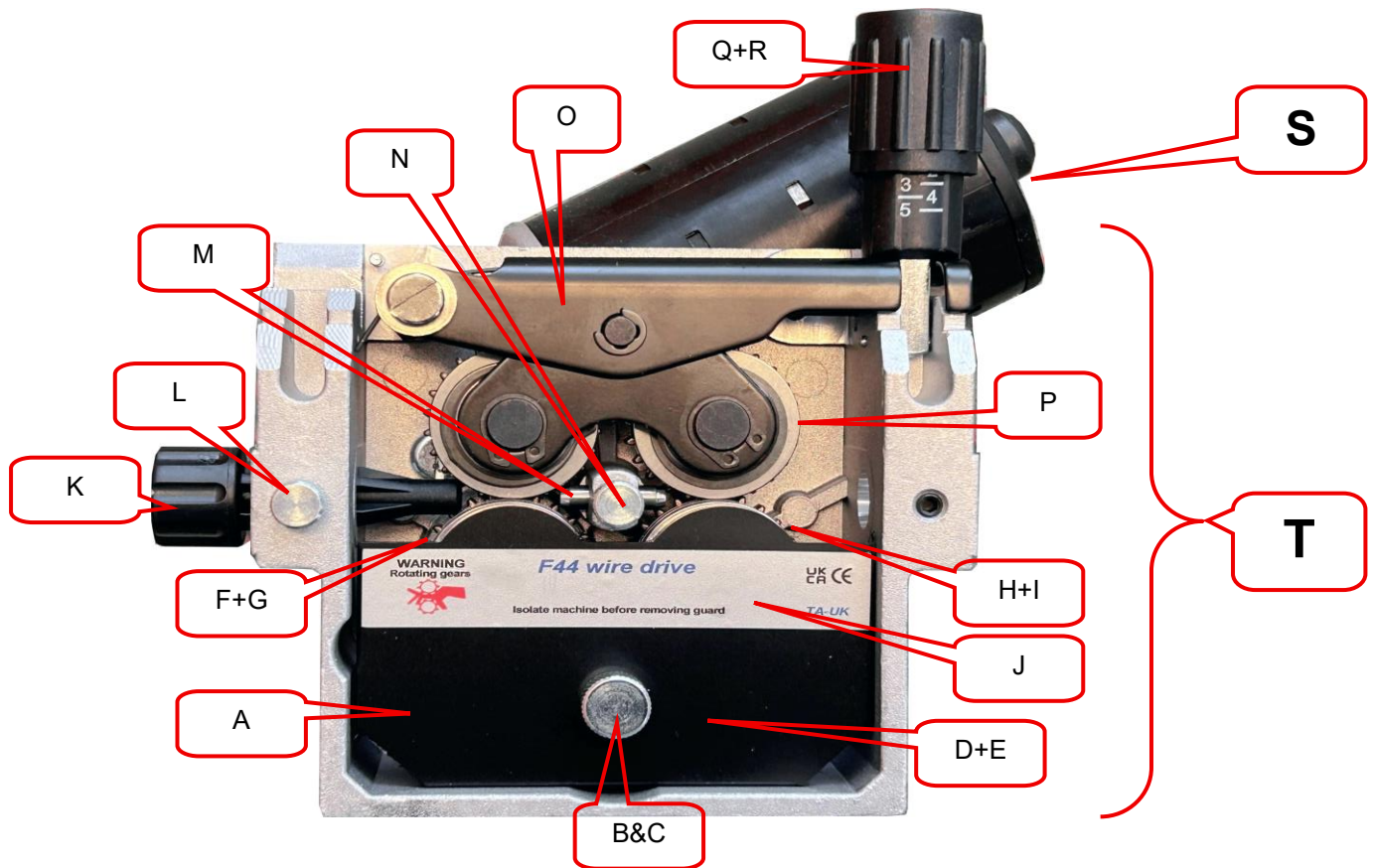
To weld simply set the amperage to desired level, fit an electrode into the holder & scratch the electrode on the workpiece, you will notice how easy the inbuilt hot start ignites the arc.

**Multiple electrode holders &
cable options for ARC welding.**



Parts list – F44 Wire feed system wear parts / electro mechanical

(wire drive system fitted to all MULTIMIG 2Pulse sources & 4X wire feeders from 05/2025 on)



Description	Part number	pcs/machine
Roller 0.6-0.8mm V groove for hard wire	FECV0608	2
Roller 0.8-1.0mm V groove for hard wire	FECV0810	2
Roller 1.0-1.2mm V groove for hard wire	FECV1012	2
Roller 1.2-1.6mm V groove for hard wire	FECV1216	2
Roller 1.0-1.2mm U groove for soft wire	FECU1012	2
Roller 1.2-1.6mm V groove for soft wire	FECU1216	2
Roller 1.0-1.6mm Knurled for flux cored	FECK1016	2
Roller 1.6-2.4mm Knurled for flux cored	FECK1624	2
A) Plastic retaining guard complete with label, thumbscrew & circlip	FECX4401	1
B) Guard retaining thumbscrew only M4x16 w. shank	FECX4402	1
C) Thumbscrew retaining circlip only (behind guard)	FECX4403	1
D) Bottom idle gear (behind plastic guard)	FECX1003	2
E) Axle shaft for bottom gear (behind plastic guard)	FECX4404	2
F) Left hand gear	FECX1001	1
G) Parallel key for gear 4x4x8	FECX4410	2
H) Right hand gear	FECX1003	2
I) Parallel key for gear 4x4x8	FECX4410	2
J) Axle shaft for RH gear (behind plastic guard)	FECX4404	2
K) Inlet guide 0.6-1.6mm wire	FECX4405	1
L) Inlet guide retaining thumbscrew M5x14	FECX4406	1
M) Intermediate wire guide 19mmx4mm 0.6-1.6mm wire	FECX4407	1
N) Retaining thumbscrew M5x8	FECX4408	1
O) Pressure arm assembly complete with all rollers, gears & axles	FECX4409	1
P) Pressure roller & gear only	FECX1002	2
Q) Pressure adjuster device complete	FECX4411	1
R) Soft spring for pressure adjuster – option for aluminum wires	FECX4412	
S) Wire drive motor & gearbox only	FECX4413	1
T) F44 wire drive complete with all gears rollers & parts – No motor	FECX4414	1

Accessories

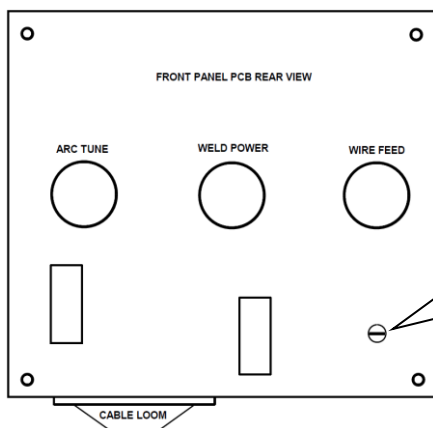
Description	273 + 271	333 + 331	413 + 411	513
	Part number	Part number	Part number	Part number
4x Wire feed unit only (No intercon)	3003133	3003133	3003133	3003133
Swivel kit & castors	3003134	3003134	3003134	3003134
5m intercon. lead	3003135	3003135	3003136	3003137
10m intercon. Lead	3003138	3003138	3003139	3003140
15m intercon. Lead	3003141	3003141	3003142	3003143
20m intercon. Lead	3003144	3003144	3003145	3003146
5m watercooled intercon. lead	3003147	3003147	3003148	3003149
10m watercooled intercon. Lead	3003150	3003150	3003151	3003152
15m watercooled intercon. Lead	3003153	3003153	3003154	3003155
20m watercooled intercon. lead	3003156	3003156	3003157	3003158
MIG torches	Multiple choices in 3M, 4M & 5M please check with your supplier or OXFORD WELDERS			
WP26 TIG torch	MMWP26...(add 2 suffix digits 4M/8M to specify length option)			
WP17 TIG torch	MMWP17...(add 2 suffix digits 4M/8M to specify length option)			
WP18 water cooled TIG Torch	MMWP18...(add 2 suffix digits 4M/8M to specify length option)			
WP20 water cooled TIG torch	MMWP20...(add 2 suffix digits 4M/8M to specify length option)			
Spool gun – MIG 8M 240A	MMS240 (fits all models)			
Spool gun – MIG 8M 360A	MMS360 (fits all models)			
MMA cables & torches	Multiple choices please check with your supplier or OXFORD WELDERS			
Water cooled SACIT coolant	XCSACIT2L (2L bottle) (for all water cooled models)			

Parts list – 4x WIRE FEED UNIT

Description	Part number	pcs/machine
Wire drive parts as page 14		
Euro connector c/w plastic flange & brass stem, tube	1003000	1
Spool holder	1002002	1
Spool cover	1003124	1
Power cable connection	1003125	1
Power cable	1003126	1
RED Panel mount water snap fitting	1003127	1
BLUE Panel mount water snap fitting	1003128	1
Handle	1003129	1
Set of 4 feet & mounting hardware	1003130	1
Castors (optional fitment)	1003131	4
Door catch	1003132	1
Complete cabinet, door and side panel	1003133	1

Trouble shooting guide

Problem	Possible cause	Solution & checks
Machine trips circuit breaker during welding.	Incorrect circuit breaker used.	Check size against specifications. Check type – it should be a 'D' rated (slow) type.
Wire feed motor not running when torch switch pressed.	Internal/external switch incorrect position.	Check switch inside wire feed compartment in correct position.
Fan not running when machine powered up.	No fault.	The fan only runs when needed.
Machine stops welding after a period of use on higher settings. The display shows "F".	Possible overheated internal components caused by duty cycle being exceeded	Reduce output power or welding time to prevent re-occurrence. Constantly overloading any machine will cause excessive wear. Leave machine switch on for 5-10 minutes & retry.
Water cooled machine stops welding after 5-10 seconds of use. The display shows "F".	Water flow Fault	Check fluid is flowing back to tank when torch trigger pressed. Check fluid level & quality. Check for damaged hoses.
Machine display shows "F" constantly or randomly	Over voltage or under voltage supply.	Switch off immediately & check correct supply connected. If using with a generator carefully check generator voltage or consult an experienced Engineer.
Machine MIG welds but arc is a bit erratic or pulses.	Too much inductance set. Wire feed fault. Excess wire speed set.	Check the tension on the wire drive arm, it should not be too high or too low, around half way is a good setting. Replace the torch liner. Check the torch liner is the correct size to match the wire, this is very important, normally a blue liner is suitable for 0.6 & 0.8mm wire, a red liner for 1.0 & 1.2mm only. Turn arc tune further clockwise to reduce inductance. Try to keep the torch straight it assists the feeding of wire. Reduce speed setting on the wire speed control.
MIG wire intermittently sticks to contact tip when welding	Wire feeding problem or torch overheating.	Check wire feed & torch carefully as above. Check contact tip is tightened into torch. If torch is overheating use a higher rated torch.
MIG weld has some small bubbles noticeable.	Gas coverage problem.	Check gas flow rate is adequate, clean out the nozzle or replace nozzle if damaged, make sure the torch is in good condition & check for gas leaks from the torch, machine or regulator. Air can be drawn into a leaking regulator or hose.
Welding performance appears to have reduced, or deteriorates during welding.	Overheated or damaged welding cables or earth clamp.	Check all weld cables, cable lugs & the work piece (earth) clamp for any signs over overheating or damage.
MIG wire consistently fuses to contact tip or sticks into weld at finish of welding.	Incorrect burn back setting.	Adjust burn back as diagram below. If wire sticks to tip turn CCW, if its sticking into weld pool turn CW.

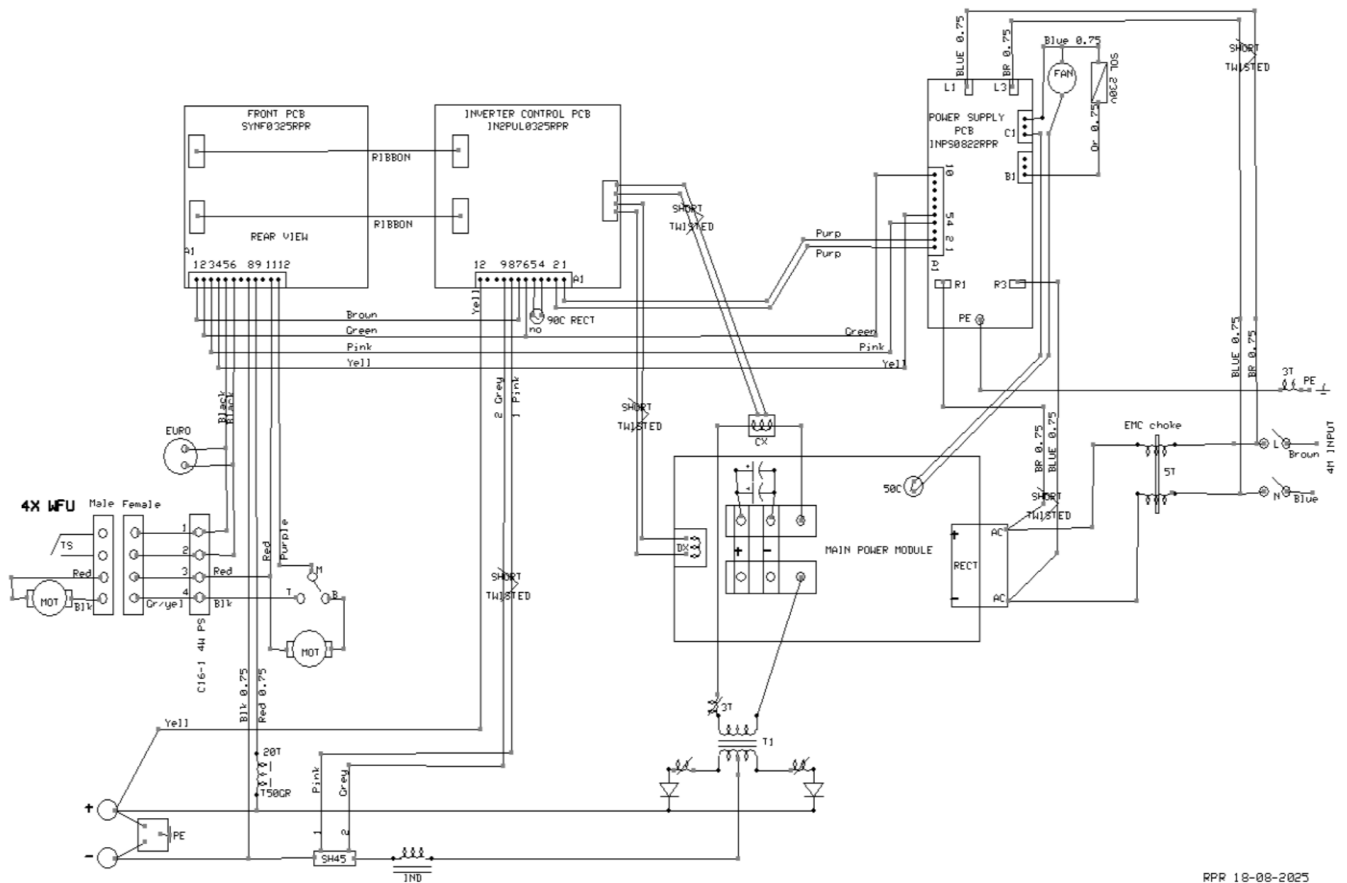


Burn back adjustment – Front panel PCB (Inside MULTIMIG)
Isolate incoming supply before removing side cover.
Adjust using a 2-2.5mm wide flat screwdriver through hole in rear of PCB.
Factory set to 9'o' clock (50%).
CW = reduce burn back time
CCW = increase burn back time

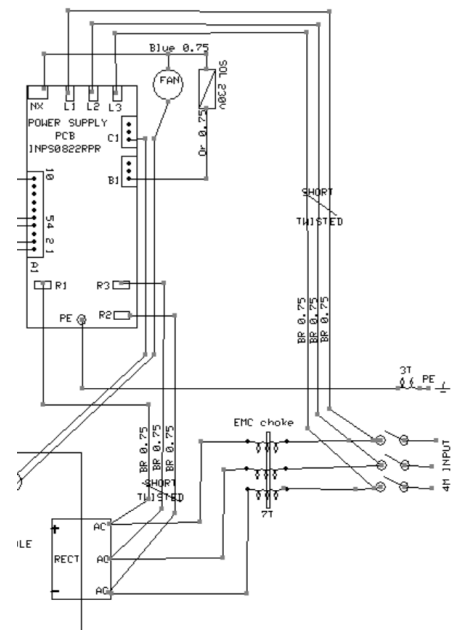
For any technical assistance or problems contact your local OXFORD supplier in the first instance. Or contact OXFORD WELDERS directly. MULTIMIG models are ultra reliable & simple to service. All have fault finding LED's fitted to internal PCB's. We can diagnose almost any problem within minutes over the phone or by email.

Schematic diagram 1 phase 230V models

OXFORD CS 2Pulse Synergic inverter 230V - Aug 2025



Schematic diagram 3 phase 400V models (input variation only)



Maintenance

General

These models are designed to be easy to maintain with little to go wrong however sensible basic maintenance should be carried out to maintain reliable operation.

Firstly, cables can easily become damaged in an industrial environment, the operator should carry out daily checks of all cables, welding cables and connections etc; any faults must be reported to a competent person and the machine taken out of service until repaired. Particular attention should be paid to the mains input cable to ensure it is kept safely away from anything which may damage it. In the event of any crush damage, insulation damage or other damage, isolate the machines supply at the wall immediately.

Any wheels & running gear should be regularly checked for condition, with particular attention paid to the rear wheels & axles to ensure stability when a gas cylinder is fitted.

The welding torch & wire feed roller mechanism needs to be checked & cleaned regularly to ensure best performance; the torch liner will need replacing after a few rolls of wire or every few months.

The wire feed rollers & gears should be checked every few months or sooner in production environments.

Internal & engineer maintenance

A comprehensive service inspection and test should be carried out at regular intervals by a competent person and documented; this should also include an electrical safety test to BS EN IEC60974-4

The frequency of this service depends mainly on machine usage & conditions. For fabrication & general production work this should be every 12 – 24 months or sooner in high production or harsh operating conditions. However if the machine is used for occasional work & used in clean dry conditions its perfectly acceptable to consider a 3-5 year service interval.

Do not attempt any electrical repairs without first isolating any incoming mains power supply. Internal capacitors can store high voltage for extensive periods, take great care around high voltage PCB's & parts.

Do not attempt any electrical repairs unless fully competent.

Do not attempt any maintenance or inspection of any feed mechanisms or fans or other moving parts without switching machine to off or there is a risk of injury.

The outer covers from the power source should be removed & dust cleaned out in the lower fan cooled section, with particular attention made to excess dust build up on or around the main components. All internal connections & wiring should be inspected for any signs of overheating or failure. Particular attention should be paid to the main welding circuit power connections & output socket connectors.

The upper section of the MULTIMIG is not in the cooling air flow & should remain relatively clean, however any dust or debris should be removed carefully if needed.

We aim to offer the very best long term support for your OXFORD machine. We stock all parts in York & will provide service & support to keep it working for you for a minimum of 25 years from purchase.

Your OXFORD supplier should be able to organize all service, testing & supply of spares for this machine & should be contacted in the first instance.

Alternatively please contact us directly at sales@oxfordwelders.co.uk.

Or telephone 01904 410041 (overseas +44 1904 410041)

Spare parts not shown in this manual

All spare parts are readily available from your OXFORD supplier.

If overseas please contact the selling agent or contact us direct on sales@oxfordwelders.co.uk

Manufactured in Great Britain by:

Oxford Welders / Technical Arc Ltd

York

YO19 5UP

UK

Tel: 01904 410041 (International +44 1904 410041)