



# ADVANCETIG 320AC/DC MULTI-PROCESS TIG WELDER

## OPERATING INSTRUCTIONS



400V 50HZ  
THREE PHASE



IGBT  
INVERTER  
TECHNOLOGY



ALTERNATING  
/DIRECT  
CURRENT



CONSTANT  
CURRENT



HF START  
TIG



SPIKE/  
GENERATOR  
SAFE



PULSE  
WELDING  
OUTPUT



IP23 CORROSION  
& SALT SPRAY  
RESISTANT



LIFT TIG



WATER COOLER



## ADVANCETIG 320AC/DC

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# ADVANCETIG 320AC/DC

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# MULTI-PROCESS TIG WELDER

## • ADVANCETIG 200AC/DC •

The ADVANCETIG Series are at the top of their class featuring state-of-the-art IGBT technology. Results speak for themselves, achieved with top level features such as adjustable arc force, AC wave and a program saving function. Designed tough to last in rugged NZ workshops and onsite tasks.



- IGBT module inverter technology for smooth & stable output, increased reliability and high duty cycle
- Phase loss protection for automatic shut down if power supply phase loss occurs, to prevent damage
- Integrated heavy duty industrial trolley and water cooler (optional)
- Damage resistant industrial casing with front panel
- Microprocessor control system for superior & dynamic arc characteristics
- Lightweight & compact design ideal for portable applications
- Extreme stress testing to 550V in production for rugged reliability
- Adjustable arc force, hot start & automatic anti stick control for greater control and ease of use for MMA welding
- Lift TIG and HF start modes for versatility when welding around sensitive electronic equipment
- Electronic HF TIG arc ignition system for contamination free and easy arc starting with low EMF interference
- 2T/4T trigger control modes
- Dual digital display meters for accurate pre setting and feedback of welding parameters & output.
- High quality & over specified electronic components for durability & reliability
- Digital up/ down button remote control and wireless foot pedal (optional)
- Quick connect inlet gas fitting for ease of use and changing of gas bottles.

DIMENSIONS:	WEIGHT:	INPUT POWER SUPPLY:	MAX. INPUT CURRENT:	GENERATOR CAPACITY:	CURRENT OUTPUT:	AC FREQ ADJ:	DUTY CYCLE MMA+DC TIG /AC TIG	TIG PULSE FREQUENCY:	AC TIG WAVEFORM	STANDARDS:	MAX WELD THICKNESS:
550 x 240 x 445mm	25kg	400V AC 50Hz	25A	17.3KVA	10 - 320A	50-250Hz	60% @ 320A	0.5-900Hz	Square, Sine Triangular	EN60974-1:2012	12mm +



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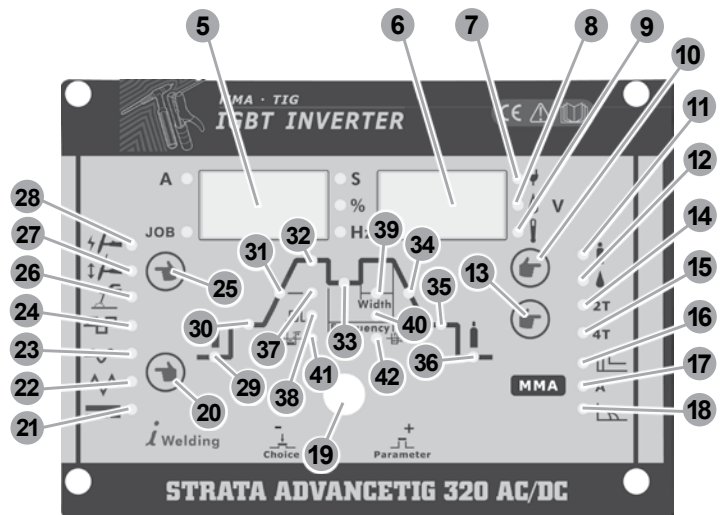
## Know Your Machine

More detailed explanations of function on following pages.

1. Positive (+) welding power output connection socket.
2. TIG torch remote connection socket
3. TIG torch gas connector.
4. Negative (-) welding power output connection socket.

### Control Panel

5. LH Multifunction Display
6. RH Multifunction Display
7. Mains power indicator
8. Water cooling system error indicator
9. Error/ Overload Indicator
10. Water/ Air Cooling Selection Button
11. Air cooling mode indicator
12. Water cooling mode indicator
13. 2T/4T trigger mode selector button
14. 2T mode indicator
15. 4T mode indicator
16. MMA hot start setting indicator
17. MMA welding current indicator
18. MMA Arc Force setting indicator
19. Parameter select/ adjust knob
20. Welding current mode selection button
21. DC Wave Output Indicator
22. AC Triangle Wave Output Indicator
23. AC Sine Wave Output Indicator
24. AC Advanced Square Wave Output Indicator
25. Welding Mode Selection Button
26. MMA Mode Indicator
27. Lift TIG mode Indicator
28. HF TIG mode indicator
29. Pre gas flow setting indicator
30. Start current setting indicator
31. Up slope setting indicator
32. TIG peak welding current setting indicator
33. TIG base welding current setting indicator
34. Down slope setting indicator
35. End current setting indicator
36. Post gas flow setting indicator
37. Pulse mode 'off' indicator
38. Pulse mode 'on' indicator
39. Pulse width setting indicator
40. Pulse frequency setting indicator
41. Clean width area/ AC Balance adjustment
42. AC Frequency Adjustment







## ADVANCETIG 320AC/DC

### Further Controls Explained

#### LH Digital Multifunction Display (5)

Before welding this displays the setting selected or being adjusted using the control knob (19). During welding it displays welding current. The parameter setting displayed is indicated by the LEDs beside the display; Current (A), Saved Setting (JOB), Time (S), Percentage (%) and Frequency (Hz). If left inactive for several seconds, display will revert back to main welding current setting.

#### RH Digital Multifunction Display (6)

Before welding this displays secondary functions and error codes. During welding it displays welding voltage.

#### Multifunction Smart Control Knob (19)

Press knob to navigate through the control panel parameters not controlled by specific selector buttons. Parameter/ setting selected will be indicated by the LED on the control panel and the value shown on the LH display (5). Adjust the parameter by turning the knob. Access the job/ program store/ recall function by pressing and holding the knob.

#### Water Cooling System Error Indicator (8)

When using the integrated water cooler, the system is equipped with a pressure sensor. If the coolant pressure is insufficient, this indicator will light and the welding output will not be able to be active, in order to protect the torch and cooling system.

#### Overload/ Error Indicator (9)

Lights when over voltage, over current, input phase loss or electrical overheating (due to exceeding duty cycle) is detected and protection is activated. When protection is activated, welding output will be disabled until the safety system senses the overload has reduced sufficiently and indicator lamp goes out. May also trigger if machine experiences an internal power circuit failure.

#### Water / Air Cooling Selection Button (10)

When using the integrated water cooling system with a water cooled torch, select the 'water' option (12).

This will activate the water cooler power (the water cooler must also be switched on the rear panel) and the water cooling protection system. If using air cooled torch, select 'Air' option (11).

Note the AdvanceTig 320AC/DC comes standard with a watercooled torch system. Operating a water cooled torch without water cooling will quickly cause serious damage to the torch. Damage to torch or components due to lack of water is not covered under machine warranty.

### MMA Settings

#### Hot start (16)

Hot start provides extra power when the weld starts to counteract the high resistance of the electrode and workpiece as the arc is started.

#### Arc Force (18)

An MMA welding power source is designed to produce constant output current (CC). This means with different types of electrode and arc length; the welding voltage varies to keep the current constant. This can cause instability in some welding conditions as MMA welding electrodes will have a minimum voltage they can operate with and still have a stable arc.

Arc Force control boosts the welding power if it senses the welding voltage is getting too low. The higher the arc force adjustment, the higher the minimum voltage that the power source will allow. This effect will also cause the welding current to increase. 0 is Arc Force off, 10 is maximum Arc Force. This is practically useful for electrode types that have a higher operating voltage requirement or joint types that require a short arc length such as out of position welds.

### TIG Settings

#### TIG 2T/4T trigger control (13)

In 2T mode (14) the trigger is pulled and held on to ac-



## ADVANCETIG 320AC/DC

tivate the welding circuit, when the trigger is released, the welding circuit stops. 4T (15) is known as 'latching' mode. The trigger is pulled once and released to activate the welding circuit, pulled and released again to stop the welding circuit. This function is useful to longer welds as the trigger is not required to be held on continuously.

### Pre Flow (29)

Controls the period shielding gas will flow for when the torch is triggered before the arc starts. This purges the work area of atmospheric gas which could contaminate the weld before the weld starts.

### Start current setting (30)

Sets a specific starting welding current when the trigger is first activated. In 4T mode this will activate for as long as the torch trigger is held on to 'latch' it before the main weld current is started. Once the trigger is released, the current will go through the upslope (31) period if it is set, to the main welding current (32).

### Up Slope (31)

When the trigger is activated, the welding current will increase gradually over the time selected up to the set main welding current (32).

### Down Slope (34)

When the trigger is released, the welding current will reduce gradually over the time selected down to 0. This allows the operator to complete the weld without leaving a 'crater' at the end of the weld pool.

### End Current Setting (35)

Sets a specific ending welding current when the trigger is released. In 4T trigger mode this will activate for as long as the trigger is held on to 'unlatch' it before the weld is finished. If downslope (34) is set, the current will go through the downslope period before going to the end current set. When the trigger is released, the arc will stop.

### Post Flow Gas (36)

Controls the period of time the shielding gas continues to flow for after the arc is stopped. This protects the weld area and torch tungsten from contamination

while it is still hot enough to react with atmospheric gases, after the weld is finished.

### Pulse Settings (38)

Only available when pulse mode (38) is selected.

### Base Current (33)

Sets the current of the low/ base pulse.

### Pulse Frequency (40)

Sets the rate that the welding output alternates between the peak and base current settings.

### Pulse Width (39)

Sets the time proportion as a percentage between the peak current and base current when using pulse mode. Neutral setting is 50%, the time period of the peak current and base current pulse is equal. Higher pulse duty setting will give greater heat input, while lower pulse duty will have the opposite effect.

### AC Settings

Only available in AC welding modes (22,23,24)

### Clean Width Area / AC Balance Adjustment (41)

Adjusts the balance as a percentage between the forward and reverse current cycles when welding in AC output mode. The reverse part of the AC cycle gives the 'cleaning' effect on the weld material, while the forward cycle melts the weld material. Neutral setting is 0. Increased reverse cycle bias will give greater cleaning effect, less weld penetration and more heat in the torch tungsten, which gives the disadvantage of reducing the output current that can be used for a given tungsten size, to prevent the tungsten overheating. Increased forward cycle bias will give the opposite effect, less cleaning effect, greater weld penetration and less heat in the tungsten.

For maximum effectiveness, ideally the clean width/ AC balance should be set with as much forward cycle bias as possible, while still maintaining a sufficient level of oxidation removal for a contamination free weld pool. The cleaner non-ferrous metal is before welding, the more effective it is to weld. This effect can also be used to reduce heat in the tungsten, al-



## ADVANCE TIG 320AC/DC

lowing use of a pointed tungsten tip shape for a more defined arc.

### AC Frequency Adjustment (42)

Increasing AC frequency will focus the shape of the arc, resulting in a tighter, more controlled arc causing increased penetration and less heated affected area for the same current setting. Slower frequency will result in a wider, softer arc shape.

## AC/DC Output Modes

### DC (Direct Current) Welding Output (21)

Suitable for TIG welding ferrous (iron based) metals such as mild steel and stainless steel, copper and titanium. Also for most MMA applications.

TIG welding reactive metals such as Aluminium, Magnesium and Zinc requires AC (alternating current) output. When reactive metals are exposed to air they form an oxide layer that insulates the base metal and prevents welding current flowing, it also contaminates the weld pool. Reverse current flow is required to break through/ clean off this oxide layer so that welding can take place, while the current flow during the positive cycle does the majority of the heating of the weld pool area.

### AC Triangle Wave Welding Output (22)

Reduced heat input for same current setting. Especially useful for welding thin metal.

### AC Sine Wave Welding Output (23)

Traditional AC TIG welding wave form. Quieter, 'soft' arc characteristic

### AC Square Wave (24)

Focused arc for maximum penetration, fast travel speed with best directional control. Also used for some MMA applications.

## TIG Arc Starting Modes

### 27/28 TIG HF/ Lift Ignition Modes.

For TIG welding process, contact of the torch tungsten to the workpiece will cause contamination of the tungsten and the workpiece that will adversely affect the weld quality, especially when the tungsten is electrically energised. HF (high frequency) ignition sends a pulse of high energy electricity through the torch system that is capable of 'jumping' between the tungsten and the workpiece, ensuring arc starting without any contact between the tungsten and workpiece. The disadvantage of HF ignition is that the high energy electrical pulse creates significant electrical and radio signal interference, which limits its use around sensitive electronic equipment such as computers.

Lift TIG ignition is a compromise that minimises tungsten contamination while eliminating the electrical interference of HF start systems. Lift arc starting works by lightly resting the tungsten on the workpiece, activating the torch trigger signal and then lifting the tungsten off. The control circuit will sense when the tungsten is removed from the work piece and send a low powered pulse of electricity through the tungsten that will cause the TIG arc to initiate. Because the tungsten is not 'live' when it is in contact with the work, contamination is minimised.

## Program/Job Memory

The AdvanceTig 320 ACDC has 10 memory/ job spaces that parameters can be saved to for easy recall. To access a saved program, press and hold in the control knob (19) and the program number 0-9 will show on the display, the 'JOB' indicator will be lit. Adjust to the program number required by rotating the control knob. Once the program is accessed, it will automatically load. To return to normal parameter settings, press the control knob again (which will also load the selected program) To save parameters set as a program, press and hold the control knob for a few seconds and the display will blink. The settings are now saved in the last program space that was selected. If setting parameters to save as a program, ensure that you start with a program number that the data is OK to overwrite, as the previous settings saved to that memory space will be lost.





## ADVANCETIG 320AC/DC

### Tips & Tricks

#### Pulse Welding

Pulse welding mode switches the welding output between a high and low current output in a cyclical manner. When used correctly this function has substantial benefits in the TIG welding process including greater weld penetration for less work heat input and greater control of the weld pool.

The basic theory for setting the base current using pulse mode is that the base current should be sufficient to maintain the existing molten weld pool, while the peak current is sufficient to melt new metal in order to move/ expand the molten weld pool. Increased pulse frequency will have the effect of making the arc more tightly focused which is useful for fine stainless work and similar.

Pulsing can also be used to help move the weld pool, this technique is useful for welding out of position or with materials that have higher viscosity weld pool. Higher pulse duty setting will give greater heat input, while lower pulse duty will have the opposite effect.

#### Remote Current Control

The ADVANCETIG 320 AC/DC can accept remote current control from a potentiometer/ analogue signal or a digital up/down button signal. Potentiometer remote control will change the current from the 5A minimum to the maximum set using the machine current control (30). Using an up/ down button remote signal, the current may be increased or decreased in 1A increments, or 'scrolls' up to 30A at a time if the button is held down. This is very useful for precision work. The AdvanceTig 320 ACDC can also be used with the Strata Wireless remote control system. Refer to the accessories section further on in this manual for the options available.

#### Water Cooling

Air cooled TIG torches are only rated for 200A DC and 150A AC welding operation. The AdvanceTig 320 is supplied standard with water cooled TIG torch. The standard trolley package includes the integrated water cooler. The correct coolant to use is a mixture of Mono Propylene Glycol and water in a 1:3 ratio (25% propylene glycol. Pure water may be used as a coolant liquid, though it is not recommended for the long term reliability of the water cooling system as it does not have the lubrication properties of glycol and does not provide protection against freezing. Ready to use coolant fluid can be purchased from authorised Strata dealers.

Do not operate a water cooled torch without the cooling system operating!

#### Duty Cycle Rating

Welding duty cycle is the percentage of actual welding time that can occur in a ten minute cycle. E.g. 20% at 160 amps - this means the welder can weld at 160 amps for 2 minutes and then the unit will need to be rested for 8 minutes. All duty cycle ratings are based on an ambient air temperature of 40°C with 50% humidity, which is the international standard for such a rating. In an environment with temperatures exceeding 40°C, the duty cycle will be less than stated. In ambient temperature less than 40°C, duty cycle performance will be higher.



## Quick Start Guide - Welder Installation

### Electrical Power Supply

The ADVANCETIG 320AC/DC is designed to operate on a 3 phase 32A 400V power supply. Operating with a lower current rated supply circuit will reduce the rated maximum output and duty cycle performance.

### Operating Environment

Adequate ventilation is required to provide proper cooling. Ensure that the machine is placed on a stable level surface where clean cool air can easily flow through the unit. The ADVANCETIG 320AC/DC has electrical components and control circuit boards which may be damaged by excessive dust and dirt, so a clean operating environment is important for reliable product life.

### Basic Operation

#### 1. ARC/ MMA Welding Operation

- 1.1 Connect the earth cable quick connector to the negative welding power output socket (1) Connect the earth clamp to the work piece. Contact with the work piece must be firm contact with clean, bare metal, with no corrosion, paint or scale at the contact point.
- 1.2 Insert an electrode into the electrode holder and connect the electrode holder and work lead to the positive welding power output socket (4).

*Note: This polarity connection configuration is valid for most GP (General Purpose) MMA electrodes. There are variances to this. If in doubt, check the electrode specifications or consult the electrode manufacturer.*

- 1.3 Connect the machine to suitable mains power using the mains input power lead. Switch the mains power switch to 'on' to power up the machine. Set MMA welding mode (26) using the selector button (25). Select the welding output AC (24) or DC (21) as required.

- 1.4 Set welding parameters as required following instructions in the previous section. You are now ready to weld!

#### 2. TIG Operation

*Note: TIG operation requires an argon gas supply.*

- 2.1 Connect earth cable quick connector to positive welding power output socket (4). Connect earth clamp to the work piece. Contact with work piece must be a firm contact with clean, bare metal, with no corrosion, paint or scale at contact point.
- 2.2 If using a water cooled torch, connect the water cooler interface cable from the rear of the power source to the rear of the water cooler. Connect the water cooling lines from the TIG torch to the front of the water cooler, ensuring the red and blue return and supply lines match the connectors.
- 2.3 Insert TIG torch power connection into the negative welding power output socket (1). Connect TIG torch remote plug to remote socket (42) and torch gas connection to the TIG gas outlet (3).
- 2.4 Connect the machine to suitable mains power using the mains input power lead. Switch the mains power switch to 'on' to power up the machine. Set the welding mode to 'Lift TIG' (27) or 'HF TIG' (28).
- 2.5 If a water cooled torch and water cooler is used, check the water cooler has sufficient coolant level and all connections are firmly secured, then switch on the water cooler power switch on the rear of the water cooler. Set the water/air setting button (10) to 'water (12)'. The water cooler should now start operating. If using an air cooled torch, set the button (10) to 'air' setting (11).
- 2.6 Assemble the female gas quick connector to the gas line and to the regulator outlet fitting.



# ADVANCETIG 320AC/DC

Connect the gas regulator to a gas cylinder (not included with machine) and connect the female quick connector to the male gas inlet on the rear of the machine. Ensure all connections are tight. Open gas cylinder valve and adjust regulator, flow should be between 5-10 l/min depending on application. Re-check regulator flow pres-

sure with the torch triggered as static gas flow setting may drop once gas is flowing.

- 2.7 Set the welding parameters as required following the instructions in the previous section. You are now ready to weld!

## Wireless Remote Control Configuration:

Any Strata ADVANCETIG model can be configured to communicate exclusively with any Strata wireless foot pedal or remote control panel. This is done by a simple process of synchronising the wireless remote control and the machine frequencies.

Each interface frequency assigned is unique, so it is possible to use several wireless control systems/ machines in the same area with no problems. The direct range of the Strata wireless control system is approximately 100m, this will be affected by the physical location of the machine and the remote control.

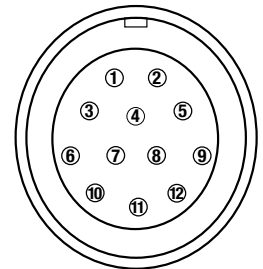
### To synchronise a remote control to a machine, follow these instructions:

- 1.1 Ensure the remote control or foot pedal is switched on
- 1.2 Press and hold the main control adjustment knob in 'select' mode and turn the machine on.
- 1.3 As the machine powers up, the LCD display will light and then go blank again. When the display goes blank, release the control knob.
- 1.4 Within 10 seconds of releasing the knob, activate the remote control or foot pedal. The LCD display on the machine should blink twice to indicate successful synchronisation. Switch machine off and back on again to start welding operation. If the operation is unsuccessful, repeat steps 1 to 5.

Please ensure the wireless foot pedal or remote control is switched off when not in use to conserve battery life. If the battery is left to go flat, the remote device may be required to be resynchronised with the machine again.

### To remove the connection with a wireless remote control:

- 2.1 Press and hold the main control adjustment knob down in 'select' mode and turn the machine on.
- 2.2 Continue holding the knob down after the LCD display goes blank. Eventually the display will blink with a wireless reset message.
- 2.3 Switch the machine off and back on again to start welding operation. The wireless synchronisation has now been removed.



### 12 Pin Remote Plug Connection

Pin No.	Spin Socket Shell	Wire Foot Pedal	Common Welding Torch	Remote Control Torch	Up-Down Torch
1	2	short circuit	-	-	-
2	5G		-	-	-
3	4	potentiometer +	-	potentiometer +	-
4	6	potentiometer centre tap	-	potentiometer centre tap	-
5	5G	potentiometer -	-	potentiometer -	-
6	7	-	-	-	up
7	8	-	-	-	down
8	3	switch	switch	switch	switch
9	5G				
10	1	-	-	short circuit	-
11	5G	-	-		-
12	No Connect	-	-	-	-



# ADVANCETIG 320AC/DC

## Available Parts & Accessories

These accessories listed are available from your Strata Supplier. Refer to the Strata Catalogue, your Strata Supplier or look online at [www.strata.co.nz](http://www.strata.co.nz) for other accessories and consumables available.

ADVANCETIG 320 AC/DC:			
17386	Strata Industrial Welding Machine Trolley	TT32-150	Thoriated Tungsten Electrode 3.2mm (3pk)
17390	Strata Water Cooling Unit	TZ16-150	Zirconiated Tungsten Electrode 1.6mm (3pk)
17372	Pro-Grip 18 Torch X 25Ft, Tgc End (Large Dinse) M12, 10K Pot and 12 Pin Hizone Plug	TZ24-150	Zirconiated Tungsten Electrode 2.4mm (3pk)
		TZ32-150	Zirconiated Tungsten Electrode 3.2mm (3pk)
17399	Strata TIG Wireless Foot Control	ACDCKIT	ACDC Tig Starter Kit - WP17, WP18, WP26
17401	Strata TIG Foot Control	TR16MS-70S-6	Mild Steel Tig Rod 1.6mm/ 1kg
17478	Earth Lead 50mm <sup>2</sup> Cable, 35-70mm Plug, 5m	TR24MS-70S-6	Mild Steel Tig Rod 2.4mm/ 1kg
17479	Arc Lead 50mm <sup>2</sup> Cable, 35-70mm Plug, 5m	TR32MS-70S-6	Mild Steel Tig Rod 3.2mm/ 1kg
17386	Strata Industrial Welding Machine Trolley	TR16SS-316	Stainless Steel Tig Rod 1.6mm
17387	Strata Industrial Welding Trolley Storage Unit	TR24SS-316	Stainless Steel Tig Rod 2.4mm
S600EH	600A Screw Type Elect. Holder	TR32SS-316	Stainless Steel Tig Rod 3.2mm
S500EC	Strata 500A Earth Clamp	TR16AL-5356	Aluminium Tig Rod 1.6mm/ 0.5kg
AG500EC	500A 'G' Style Earth Clamp	TR24AL-5356	Aluminium Tig Rod 2.4mm/ 0.5kg
CP3550	Cable Plug - 35-50mm <sup>2</sup> - Male	TR32AL-5356	Aluminium Tig Rod 3.2mm / 0.5kg
DW3000	Auto Darkening Helmet, Shade 9-13	TZ16-150	Zirconiated Tungsten Electrode 1.6mm (3pk)
DW4000	Auto Darkening Helmet, Shade 9-13 with Grinding Visor	TZ24-150	Zirconiated Tungsten Electrode 2.4mm (3pk)
		TZ32-150	Zirconiated Tungsten Electrode 3.2mm (3pk)
DW7000	Auto Darkening Helmet, Shade 9-13 with Grinding Visor And PRSL Filtration System.	ETCPH4825	Overcord R92 2.5mm Electrodes (350mm)
		ETCPH4832	Overcord R92 3.2mm Electrodes (350mm)
GR101AR	Argon Twin Gauge Regulator	ETCPH4840	Overcord R92 4.0mm Electrodes (350mm)
GR101ARFL	Argon Gas Regulator c/w Flow Meter	ETCPH6825	Overcord 2.5mm Electrodes (350mm)
GR101AR-2FL	Argon Regulator c/w Twin Flow Meter	ETCPH6832	Overcord 3.2mm Electrodes (350mm)
16895	15m H/D 15A Extension Lead (3 x 2.5mm <sup>2</sup> wiring)	ETCPH6840	Overcord 4.0mm Electrodes (350mm)
TBC57Y02	Long Black Cap	ETCPH6850	Overcord 5.0mm Electrodes (350mm)
TC10N23	Collet 1/16" (1.6mm) (2 pk)	ETCPH7725	Supercito 2.5mm Electrodes (350mm)
TC10N24	Collet 3/32" (2.4mm) (2 pk)	ETCPH7732	Supercito 3.2mm Electrodes (450mm)
TC10N25	Collet 1/8" 3.2mm (Pkt 2)	ETCPH7740	Supercito 4.0mm Electrodes (450mm)
TCB10N31	Collet Body 1/16" (1.6mm) (2pk)	ETCPH7750	Supercito 5.0mm Electrodes (450mm)
TCB10N32	Collet Body 3/32" (2.4mm) (2pk)	ETCPH56S25	Tenax 56S 2.5mm Electrodes (350mm)
TCB10N28	Collet Body 1/8" (3.2mm) (2 pk)	ETCPH56S32	Tenax 56S 3.2mm Electrodes (350mm)
TCC10N48	Std. Ceramic Cup 3/8" Bore #6 (2pk)	ETCPH56S40	Tenax 56S 4.0mm Electrodes (450mm)
TCC10N47	Std. Ceramic Cup 7/16" Bore #7 (2pk)	ETCPH56S50	Tenax 56S 5.0mm Electrodes (450mm)
TCC10N46	Std. Ceramic Cup 1/2" Bore #8 (2pk)	PDL32	Plug 4 Pin 32A 500V Angled
TCC10N45	Std. Ceramic Cup 5/8" Bore #10 (2pk)	17844	Gas Inlet QC
TT16-150	Thoriated Tungsten Electrode 1.6mm (3pk)	17847	12 Pin Strata TIG Remote Connection Plug
TT24-150	Thoriated Tungsten Electrode 2.4mm (3pk)		

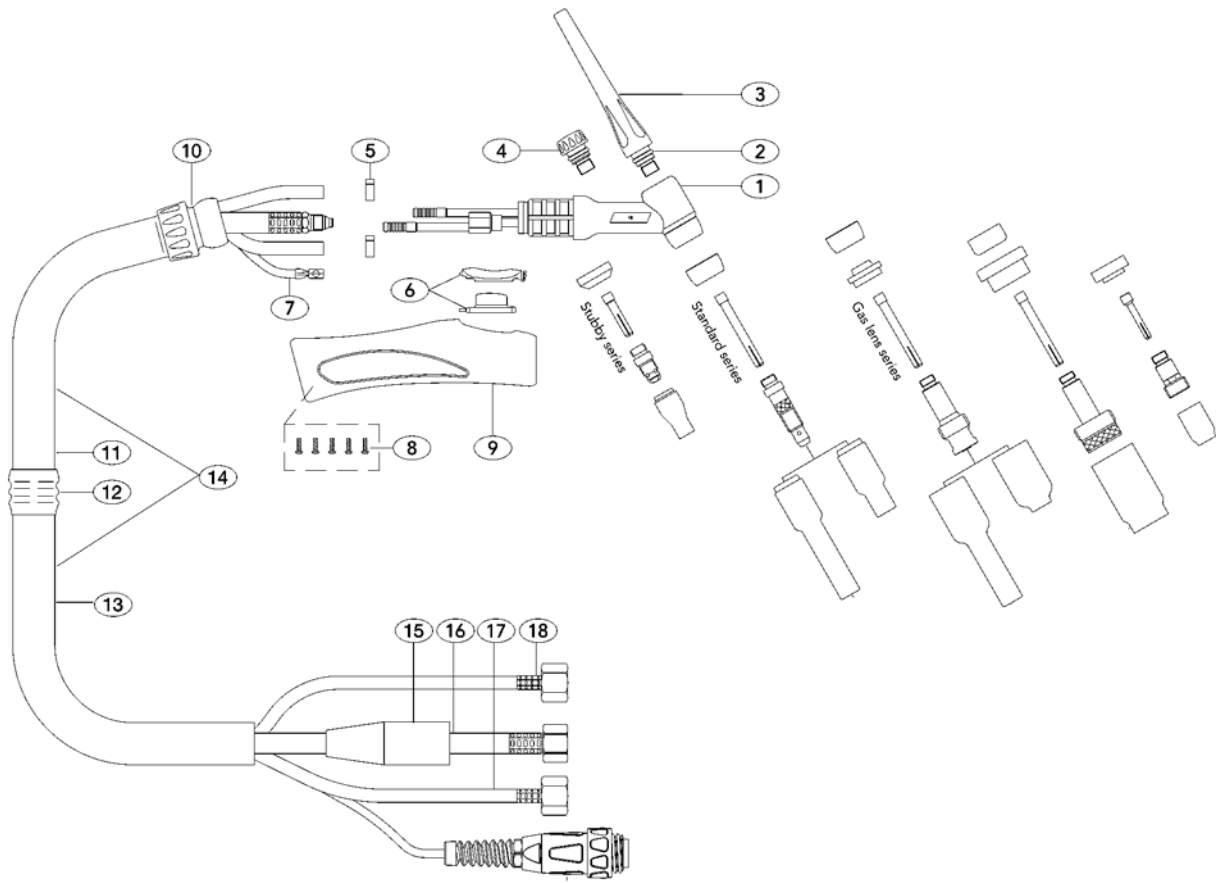


# ADVANCETIG 320AC/DC

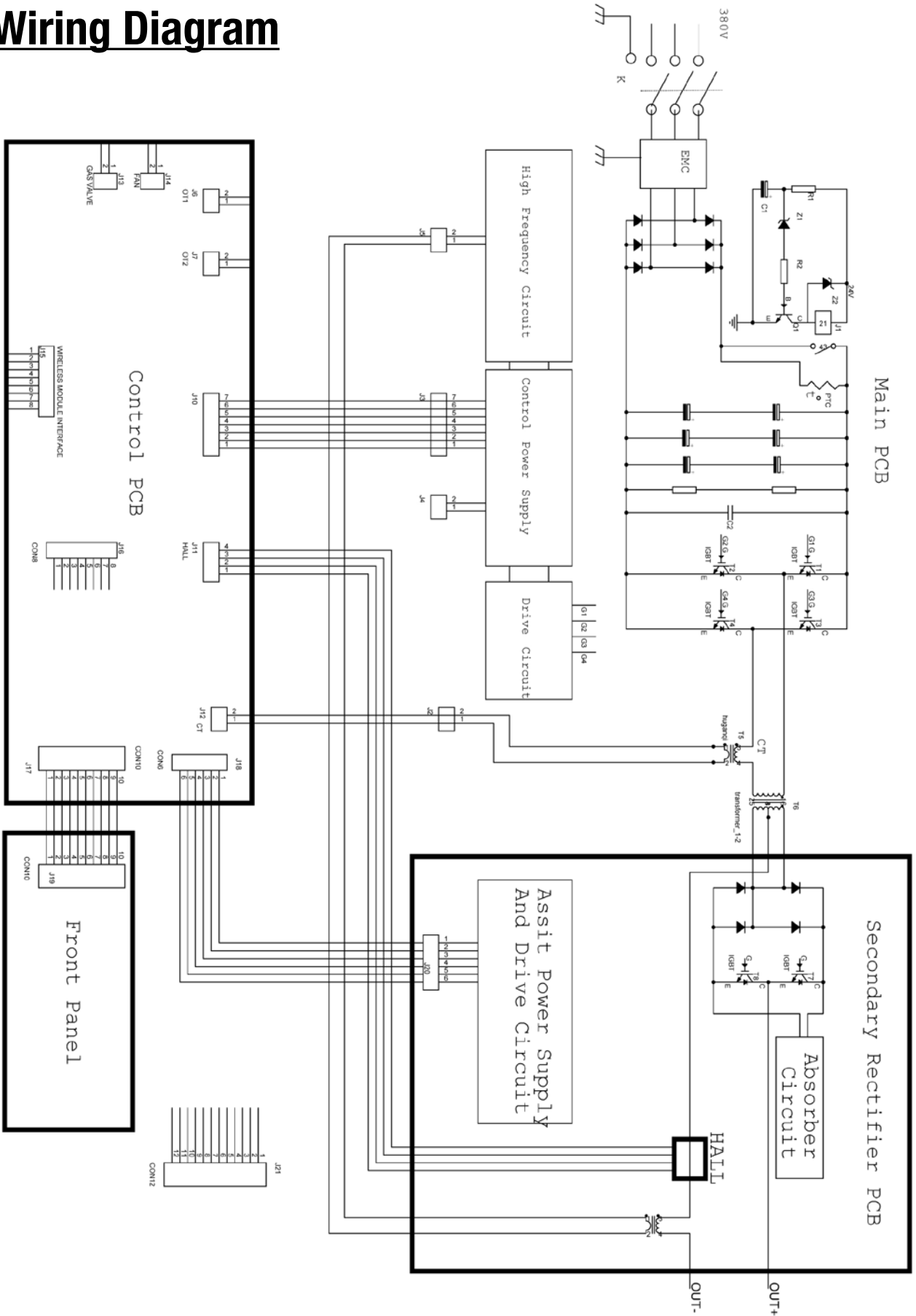
## Suregrip™ Series WP18 Torch Parts

1.	TER18	Torch Body Standard
3.	TCB57Y02	Back Cap Long
4.	TCB57Y04	Back Cap Short
6.	TER1MS	Momentary Kit
9.	UERH200	Large Ergo Tig Handle
10.	UERKJ200	Large Knuckle Joint
12.	UERJK200	Jointing Repair Kit
14.	UERC0200-40	Sheath x 12.5ft Inc Leather Cover
	UERC0200-80	Sheath x 25ft Inc Leather Cover
16.	U41V29R	Power Cable x 25ft Rubber
17.	U45V080B	Water Feed Hose x 25ft Rubber

All products conform to EN60974-7 and are RoHS, REACH and WEEE compliant



## Wiring Diagram







## Care & Maintenance

### Keep your Welding Machine in Top Condition

The ADVANCETIG 320AC/DC does not require any special maintenance, however the user should take care of the machine as follows:

- Regularly clean the ventilation slots.
- Keep the casing clean.
- Check all cables before use.
- Check electrode holders, work lead/clamps and welding torches before use.
- Replace worn electrode holders and earth clamps, which do not provide a good connection.
- Replace worn consumable parts in a timely manner.
- Use a soft cloth or brush to clean electrical components.
- Do not use liquid cleaning products, water or especially solvents.
- Do not use compressed air to clean electrical components as this can force dirt and dust further into components, causing electrical short circuits.
- Check for damaged parts. Do not use the welder with damaged parts.
- A damaged welder must be carefully checked by a qualified person to determine that it will operate properly. Check for breakage of parts, mountings and other conditions that may affect its operation. An authorised service centre should properly repair a damaged part. Have your welder repaired by an expert.

This appliance is manufactured in accordance with relevant safety standards. Only experts must carry

out repairing of electrical appliances, otherwise considerable danger for the user may result. Use only genuine replacement parts. Do not use modified or non-genuine parts.

### Storing the Welder

When not in use the welder should be stored in the dry and frost-free environment.



**WARNING!** Before performing cleaning/maintenance, replacing cables / connections, make sure the welding machine is switched off and disconnected from the power supply.



## Electrodes

### Size of Electrodes

The electrode size is determined by the thickness of metals being joined and can also be governed by the type of welding machine available. Small welding machines will only provide current (amperage) to run smaller sized electrodes.

For thin sections, it is necessary to use smaller electrodes otherwise the arc may burn holes through the job. A little practice will soon establish the most suitable electrode for a given application.

### Storage of Electrodes

Always store electrodes in a dry place and in their original containers.

### Electrode Polarity

Electrodes are generally connected to the electrode holder with the electrode holder connected positive polarity.

The work lead is connected to the negative polarity and is connected to the work piece. If in doubt consult the electrode data sheet.



## Effects of MMA Welding Various Materials

### High Tensile and Alloy Steels

The two most prominent effects of welding these steels are the formation of a hardened zone in the weld area, and, if suitable precautions are not taken, the occurrence in this zone of under-bead cracks. Hardened zone and underbead cracks in the weld area may be reduced by using the correct electrodes, pre-heating, using higher current settings, using larger electrode sizes, short runs for larger electrode deposits or tempering in a furnace.

### Manganese Steels

The effect on manganese steel of slow cooling from high temperatures causes embrittlement. For this reason it is absolutely essential to keep manganese steel cool during welding by quenching after each weld or skip welding to distribute the heat.

### Cast Iron

Most types of cast iron, except white iron, are weldable. White iron, because of its extreme brittleness, generally cracks when attempts are made to weld it. Trouble may also be experienced when welding white-heart malleable, due to the porosity caused by gas held in this type of iron.

### Copper and Alloys

The most important factor is the high rate of heat conductivity of copper, making pre-heating of heavy sections necessary to give proper fusion of weld and base metal.

### Types of Electrodes

ARC Welding electrodes are classified into a number of groups depending on their applications. There are a great number of electrodes used for specialised industrial purposes which are not of particular interest for everyday general work. These include some low

hydrogen types for high tensile steel, cellulose types for welding large diameter pipes, etc. The range of electrodes dealt with in this publication will cover the vast majority of applications likely to be encountered; are all easy to use.

### Electrodes for joining different metals

#### MILD STEEL :

**E6011** - This electrode is used for all-position welding or for welding on rusty, dirty, less-than- new metal. It has a deep, penetrating arc and is often the first choice for repair or maintenance work.

**E6013** - This all-position electrode is used for welding clean, new sheet metal. Its soft arc has minimal spatter, moderate penetration and an easy-to-clean slag.

**E7014** - All positional, ease to use electrode for use on thicker steel than E6013. Especially suitable for sheet metal lap joints, fillet welds and general purpose plate welding.

**E7018** - A low-hydrogen, all-position electrode used when quality is an issue or for hard-to-weld metals. It has the capability of producing more uniform weld metal, which has better impact properties at low temperatures.

#### CAST IRON:

**ENI-CL** - Suitable for joining all cast irons except white cast iron.

#### STAINLESS STEEL:

**E318L-16** - High corrosion resistances. Ideal for dairy work etc.

## Other Knowledge & Resources

Please refer to Euroquip website [www.euroquip.co.nz/ Downloads.html](http://www.euroquip.co.nz/Downloads.html) for knowledgebase articles & operation videos.



## Safety

### Store and Retain this Manual

Retain this manual for the safety warnings and precautions, assembly, operating, inspection, maintenance and cleaning procedures. Write the product's serial number into the NOTES section at the rear, and keep this manual and the receipt in a safe and dry place for future reference.

### Important Safety Information

Failure to follow the warnings and instructions may result in electric shock, fire, serious injury and/or death. Save all warnings and instructions for future reference.



This is the safety alert symbol to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.



**DANGER!** indicates a hazardous situation which, if not avoided, will result in death or serious injury.



**WARNING!** indicates a hazardous situation which, if not avoided, could result in death or serious injury.



**CAUTION,** used with the safety alert symbol, indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

**NOTE,** used to address practices not related to personal injury.

### General Safety Warnings

**1. Maintain labels and nameplates on the welder.** These carry important information. If unreadable or missing, contact Euroquip for a replacement.

**2. Avoid unintentional starting.** Make sure the welder is setup correctly and you are prepared to begin work before turning on the welder.

**3. Unplug before performing maintenance.**

Always unplug the welder from its electrical outlet before performing any inspection, maintenance, or cleaning procedures.

**4. Never leave the welder unattended while energised.** Turn power off before leaving the welder unattended.

**5. Do not touch live electrical parts.** Wear dry, insulating gloves. Do not touch the electrode or the conductor tong with bare hands. Do not wear wet or damaged gloves.

**6. Protect yourself from electric shock.** Do not use the welder outdoors. Insulate yourself from the work piece and the ground. Use non-flammable, dry insulating material if possible, or use dry rubber mats, dry wood or plywood, or other dry insulating material large enough to cover the area of contact with the work or the ground.

**7. Avoid inhaling dust.** Some dust created by power sanding, sawing, grinding, drilling, cutting, welding and other construction activities, contain chemicals known to cause cancer, birth defects or other harm. Your risk from these exposures varies, depending on how often you do this type of work. To reduce your exposure to these chemicals, work in a well-ventilated area, and work with approved safety equipment, such as dust masks that are specially designed to filter out microscopic particles.

**8. People with pacemakers should consult their physician(s) before using this machine.**



**WARNING!**

Electromagnetic fields in close proximity to a heart pacemaker could cause interference, or failure of the pacemaker. The use of a Welder is NOT RECOMMENDED for pacemaker wearers. Consult your doctor.



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**9. Ensure that the unit is placed on a stable location before use.**



**WARNING!**

If this unit falls while plugged in, severe injury, electric shock, or fire may result.

**10. Transportation Methods** Lift unit with the handles provided, or use a handcart or similar device of adequate capacity. If using a fork lift vehicle, secure the unit to a skid before transporting.



**CAUTION!**

Disconnect input power conductors from de-energized supply line before moving the welding power source.

**11. Exercise good work practices.** The warnings, precautions, and instructions discussed in this instruction manual cannot cover all possible conditions and situations that may occur. It must be understood by the operator that common sense and caution are factors which cannot be built into this product, but must be considered by the operator.

### Welding Safety Instructions & Warnings



**WARNING!**

Protect yourself and others from possible serious injury or death. Keep children away. Read the operating/Instruction manual before installing, operating or servicing this equipment. Have all installation, operation, maintenance, and repair work performed by qualified people.

If an operator does not strictly observe all safety rules and take precautionary actions, welding products and welding processes can cause serious injury or death, or damage to other equipment or property. Safe practices have developed from past experience in the use of welding and cutting.

These practices must be learned through study and training before using this equipment. Some of these practices apply to equipment connected to power lines; other practices apply to engine driven equipment. Anyone not having extensive training in welding and cutting practices should not attempt to weld.

Safe practices are outlined in the European Standard EN60974-1 entitled: Safety in welding and allied processes.



**WARNING!**

Only use safety equipment that has been approved by an appropriate standards agency. Unapproved safety equipment may not provide adequate protection. Eye and breathing protection must be AS/NZS compliant for the specific hazards in the work area.



**DANGER!**

Always wear AS/NZS compliant safety glasses and full face shield fitted with appropriate filter shade number (Refer Filter Table in this safety section)



**CAUTION!**

Heavy-duty work gloves, non-skid safety shoes and hearing protection used for appropriate conditions will reduce personal injuries.



**CAUTION!**

Have the equipment serviced by a qualified repair person using identical replacement parts. This will ensure that the safety of the power tool is maintained.

### Personal Safety



**CAUTION!**

Keep the work area well lit. Make sure there is adequate space surrounding the work area. Always keep the work area free of obstructions, grease, oil, trash, and other debris. Do not use equipment in areas near flammable chemicals, dust, and vapours. Do not use this product in a damp or wet location.

1. Stay alert, watch what you are doing and use common sense when operating equipment. Do not use a tool while you are tired or under the influence of drugs, alcohol or medication. A moment of distraction when operating equipment may result in serious personal injury.
2. Do not overreach. Keep proper footing and balance at all times. This enables better control of the power tool in unexpected situations.



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### Arc Rays can Burn Eyes and Skin



#### **DANGER!**

Arc rays from the welding process produce intense heat and strong ultraviolet rays that can burn eyes and skin.

1. Use a Welding Helmet or Welding Face Shield fitted with a proper shade filter (refer AS 60974-1, AS/NZS 1337.1 and AS/NZS 1338.1 Safety Standards) to protect your face and eyes when welding or watching. (See Filter Table later in this section)
2. Wear approved safety glasses. Side shields are recommended.
3. Use protective screens or barriers to protect others from flash and glare; warn others not to watch the arc.
4. Wear protective clothing made from durable, flame-resistant material (wool and leather) and foot safety protection.
5. Never wear contact lenses while welding.
4. If working on a metal wall, ceiling, etc., prevent ignition of combustibles on the other side by moving the combustibles to a safe location. If relocation of combustibles is not possible, designate someone to serve as a fire watch, equipped with a fire extinguisher, during the welding process and well after the welding is completed.
5. Do not weld or cut on materials having a combustible coating or combustible internal structure, as in walls or ceilings, without an approved method for eliminating the hazard.
6. After welding, make a thorough examination for evidence of fire. Be aware that visible smoke or flame may not be present for some time after the fire has started. Do not weld or cut in atmospheres containing dangerously reactive or flammable gases, vapours, liquids, and dust. Provide adequate ventilation in work areas to prevent accumulation of flammable gases, vapours, and dust.
7. Do not apply heat to a container that has held an unknown substance or a combustible material whose contents, when heated, can produce flammable or explosive vapours. Clean and purge containers before applying heat. Vent closed containers, including castings, before preheating, welding, or cutting.

### Noise Can Damage Hearing



#### **CAUTION!**

Noise from some processes can damage hearing. Use AS/NZS compliant ear plugs or ear muffs if the noise level is high.

### Work Environment Safety



#### **DANGER!**

Remove any combustible material from the work area.

1. When possible, move the work to a location well away from combustible materials. If relocation is not possible, protect the combustibles with a cover made of fire resistant material.
2. Remove or make safe all combustible materials for a radius of 10 metres around the work area. Use a fire resistant material to cover or block all doorways, windows, cracks, and other openings.
3. Enclose the work area with portable fire resistant screens. Protect combustible walls, ceilings, floors, etc., from sparks and heat with fire resistant covers.

### Electricity Can Kill



#### **DANGER!**

Touching live electrical parts can cause fatal shocks or severe burns. The electrode and work circuit is electrically live whenever the output is on.

The input power circuit and machine internal circuits are also live when power is on. In semi-automatic or automatic wire welding, the wire, wire reel, drive roll housing, and all metal parts touching the welding wire are electrically live. Incorrectly installed or improperly grounded equipment is a hazard.

1. Do not touch live electrical parts.
2. Wear dry, hole-free insulating gloves and body protection.
3. Insulate yourself from the work and the ground using dry insulating mats or covers.



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4. Disconnect input power before installing or servicing this equipment. Lock input power, disconnect switch open, or remove line fuses so power cannot be turned on accidentally.
5. Properly install and ground this equipment according to national, state, and local codes.
6. Turn off all equipment when not in use. Disconnect power to equipment if it will be left unattended or out of service.
7. Use fully insulated electrode holders. Never dip the holder in water to cool it or lay it down on the ground or the work surface. Do not touch holders connected to two welding machines at the same time or touch other people with the holder or electrode.
8. Do not use worn, damaged, undersized, or poorly spliced cables.
9. Do not wrap cables around your body.
10. Connect work piece to a good electrical ground.
11. Do not touch the electrode while in contact with the work (ground) circuit.

Recommended Protective Filters for Electric Welding		
Description of Process	Approximate Range of Welding Current in Amps	Minimum Shade Number of Filter(s)
Manual Metal Arc Welding - Covered Electrodes (MMA)	Less than or equal to 100	8
	100 to 200	10
	200 to 300	11
	300 to 400	12
	Greater than 400	13
Gas Metal Arc Welding (GMAW) (MIG) other than Aluminium And Stainless Steel	Less than or equal to 150	10
	150 to 250	11
	250 to 300	12
	300 to 400	13
Gas Metal Arc Welding(GMAW) (MIG) Aluminium and Stainless Steel	Less than or equal to 250	12
	250 to 350	13
Gas Tungsten Arc Welding (GTAW) (TIG)	Less than or equal to 100	10
	100 to 200	11
	200 to 250	12
	250 to 350	13
	Greater than 350	14
Flux-Cored Arc Welding (FCAW) - with or without Shielding Gas	Less than or equal to 300	11
	300 to 400	12
	400 to 500	13
	Greater than 500	14
Air - Arc Gouging	Less than or equal to 400	12
Plasma - Arc Cutting	50 to 100	10
	100 to 400	12
	400 to 800	14
Plasma - Arc Spraying	—	15
Plasma - Arc Welding	Less than or equal to 20	8
	20 to 100	10
	100 to 400	12
	400 to 800	14
Submerged - Arc Welding	—	2 (5)
Resistance Welding	—	Safety Spectacles or Eye Shield

Refer to standard AS/NZS 1338.1 for comprehensive information regarding the above table.





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12. Use only well-maintained equipment. Repair or replace damaged parts as soon as practical.
13. In confined spaces or damp locations, do not use a welder with AC output unless equipped with a voltage reducer.

Arc rays from the welding process produce intense heat and strong ultraviolet rays that can burn eyes and skin. Use the following table to select the appropriate shade number for a Welding Helmet or Welding Face Shield.

### Fumes And Gases



#### WARNING!

Welding produces fumes and gases. Breathing these fumes and gases can be hazardous to your health.

1. Keep your head out of the fumes. Do not breathe the fumes.
2. If inside, ventilate the area and/or use an exhaust at the arc to remove welding fumes and gases.
3. If ventilation is poor, use an approved air-supplied respirator.
4. Read the Safety Data Sheets (SDS) and the manufacturer's instruction for the metals, consumables, coatings, and cleaners.
5. Work in a confined space only if it is well ventilated, or while wearing an air-supplied respirator. Shielding gases used for welding can displace air causing injury or death. Be sure the breathing air is safe.
6. Do not weld in locations near degreasing, cleaning, or spraying operations. The heat and rays of the arc can react with vapours to form highly toxic and irritating gases.
7. Do not weld on coated metals, such as galvanized, lead, or cadmium plated steel, unless the coating is removed from the weld area, the area is well ventilated, and if necessary, while wearing an air-supplied respirator. The coatings and any metals containing these elements can give off toxic fumes if welded.

### Fire & Explosive Risks



#### WARNING!

Sparks and spatter fly off from the welding arc. The flying sparks and hot metal, weld spatter, work piece, and hot equipment can cause fires and burns.

Accidental contact of electrode or welding wire to metal objects can cause sparks, overheating, or fire.

1. Protect yourself and others from flying sparks and hot metal.
2. Do not weld where flying sparks can strike flammable material.
3. Remove all flammables within 10m of the welding site.
4. Be alert that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas.
5. Watch for fire, and keep a fire extinguisher nearby.
6. Be aware that welding on a ceiling, floor, bulkhead, or partition can cause fire on the hidden side.
7. Do not weld on closed containers such as tanks or drums.
8. Connect the work lead/clamp to the job as close to the welding area as practical to prevent welding current from travelling long, possibly unknown paths and causing electric shock and fire hazards.
9. Do not use a welder to thaw frozen pipes.
10. Remove the stick electrode from the holder or cut off the welding wire at the contact tip when not in use.

### Sparks & Hot Metal



#### WARNING!

Chipping and grinding causes flying metal, and as welds cool they can throw off slag.

1. Wear an AS/NZS approved face shield or safety goggles. Side shields are recommended.
2. Wear appropriate safety equipment to protect the skin and body.



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### Cylinders



#### **WARNING!**

Gas cylinders contain gas under high pressure. If damaged, a cylinder can explode. Since gas cylinders are normally part of the welding process, be sure to treat them carefully.

1. Protect compressed gas cylinders from excessive heat, mechanical shocks, and arcs.
2. Install and secure cylinders in an upright position by chaining them to a stationary support or equipment cylinder rack to prevent falling or tipping.
3. Keep cylinders away from any welding or other electrical circuits.
4. Never allow a welding electrode to touch any cylinder.
5. Use appropriate shielding gas, regulators, hoses, and fittings designed for the specific application; maintain them and their associated parts in good condition.
6. Turn your face away from the valve outlet when opening the cylinder valve.



## ADVANCETIG 320AC/DC

### Warranty

As part of an on-going commitment to excellence in product support, Euroquip offers a comprehensive product warranty program.

In order to qualify for full warranty support, your product must be registered. Product not registered with Euroquip is supported by a base 12 month warranty only. Spare parts and technical support will not be available for an unregistered product outside of this base warranty period. If a Euroquip dealer has not already registered your product, please register it online or download a physical registration form at [www.euroquip.co.nz](http://www.euroquip.co.nz).

#### **Registered warranty period for ADVANCETIG 320AC/DC:**

**Commercial Use: 36 Months**

**Domestic Use: 36 Months**

Warranty covers failure caused by manufacturing and material defects in the product, during the warranty period specified. The warranty period begins when the product is purchased by the end user. Warranty is not transferrable and is only claimable by the original purchaser.

Warranty does not cover parts that are subject to wear and tear from usage.

Warranty covers failure of a product caused by defective materials and/or manufacturing for the period given and the usage specified by Euroquip. The warranty period begins when the product is purchased by the end user. Warranty is not transferrable and is only claimable by the original purchaser.

Warranty also does not cover failure caused by the untimely replacement or service of the above wearing parts. Evidence must be provided that the product has been maintained and serviced suitably for a claim to be considered under warranty.

Failure caused by incorrect operation of the product, lack of proper care and maintenance of the product, external damage, external circumstances such as contaminated fuel or poor water supply, modifications to the product, attempted repair/ service by a party other than an Approved Service Agent, is not covered under warranty.

Warranty does not cover pre delivery service and adjustment, or failure that may occur as a result of lack of/ incorrect pre delivery service and adjustment.

Warranty does not cover any incidental, indirect or consequential loss, damage or expense that may result from any defect, failure or malfunction of a product.

Should any issue be found to be a combination of a warranty failure and a non-warranty issue, the repair cost component to rectify and repair the non-warranty failure is the customers' full responsibility.

The decision that an issue with a product qualifies as a warranty claim is made at the sole jurisdiction of Euroquip.

No costs incurred will be considered under warranty if repairs are carried out by a party other than a Euroquip Approved Service Agent, unless with prior consent in writing from Euroquip.

It is the responsibility of the purchaser to deliver a product under warranty to the nearest relevant service agent or product reseller. Warranty does not cover call outs, mileage and freight costs.

If a product is repaired under warranty, parts and labour required for the repair will be supplied at no charge. Warranty assessment and repair will be scheduled and executed according to the normal work flow at the service location and depending on the availability of suitable replacement parts.

This warranty policy is an additional benefit and does not affect the legal rights of any end user, reseller or service agent.



Scan here to register your product

<http://www.euroquip.co.nz/Contact+Us/Product+Registration+Form.html>



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