



# ADVANCETIG 205AC/DC MULTI-PROCESS TIG WELDER

## OPERATING INSTRUCTIONS



ALTERNATING/  
DIRECT  
CURRENT



CORROSION  
RESISTANT



SPIKE/  
GENERATOR  
SAFE



IGBT  
INVERTER  
TECHNOLOGY



INTELLIGENT  
PROTECTION  
SYSTEM



230V 50HZ  
SINGLE  
PHASE



## ADVANCETIG 205AC/DC

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- Automotive
- Home / Hobby Engineering
- Farming
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# ADVANCETIG 205AC/DC

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# INVERTER TIG WELDER

## • ADVANCETIG 205AC/DC •

Featuring the latest IGBT and active PFC technology the ADVANCETIG 205AC/DC is reliable, easy to use and energy efficient. Designed tough with IP23 and high quality, overspecified components - this machine is made for rugged NZ workshops and onsite tasks.



- IGBT inverter technology for smooth & stable welding output and increased reliability
- Increased duty cycle and energy efficiency with active PFC technology
- Multi voltage input - will operate with wide range of input voltage, can even be used with long extension leads
- Industrial IP23 casing with front panel protection resists damage, moisture and corrosion
- Microprocessor control system for superior and dynamic arc characteristics
- Lightweight & compact design, ideal for portable applications
- Extreme stress tested in production up to 440V, ensuring rugged reliability
- Lift TIG and HF start modes gives versatility when welding around sensitive electronic equipment
- Electronic HF TIG arc ignition system, contamination free and easy arc starting with low EMF interference
- 2T/4T multi-level trigger control modes
- Dual digital display meters for accurate pre-setting and feedback of welding parameters and output
- Durable and reliable with high quality & over specified electronic components
- Intelligent protection system with temperature, voltage and current sensors for increased reliability and safety
- Designed to work with generator power supply with protection from power surges.
- Multi PCB construction is economical to service and repair compared to single PCB design
- All remote functions connect through single plug 12 pin connection
- Quick connect inlet gas fitting
- Accessories include 3m earth lead with heavy duty earth clamp, 4m MMA lead with heavy duty twist lock electrode holder, Strata Professional PRO26 25ft TIG torch with thumbwheel remote control, 2 stage flowmeter, argon gas regulator, 4m gas hose, gas inlet quick connector and hose clamps.

### ADVANCETIG 205AC/DC

DIMENSIONS (LxWxH)	WEIGHT	INPUT POWER SUPPLY	INPUT POWER SUPPLY TOLERANCE	MAXIMUM INPUT CURRENT	GENERATOR CAPACITY	MMA, AC/DC TIG CURRENT OUTPUT	MMA O/C VOLTAGE	MMA DUTY CYCLE	AC TIG DUTY CYCLE	DC TIG DUTY CYCLE	TIG UP SLOPE DOWN SLOPE ADJUSTMENT
492 x 189 x 350mm	15kg	230V AC 15A 50/60Hz	90 - 275V AC	32A	8kVA	5 - 200A	67V	200A@22% 140A@60% 110A@100%	200A@60% 155A@100%	200A@22% 140A@60%	0-10s
TIG GAS POST FLOW/PRE-FLOW ADJUSTMENT	TIG PULSE FREQUENCY	TIG PULSE WIDTH RANGE	AC TIG WAVEFORM	AC FREQUENCY ADJUSTMENT	INSULATION CLASS	POWER EFFICIENCY	POWER FACTOR	STANDARDS	MMA ROD SIZE	WARRANTY	
0-2/0-10s	0.5 - 200Hz	5 - 95%	Square wave Sine Wave	50-250Hz	IP23	80%	0.99	EN60974-1: 2012	1.6 - 5.0mm	36 months* with registration	

\* 36 Month Warranty only with online registration of product - [www.strata.co.nz](http://www.strata.co.nz)



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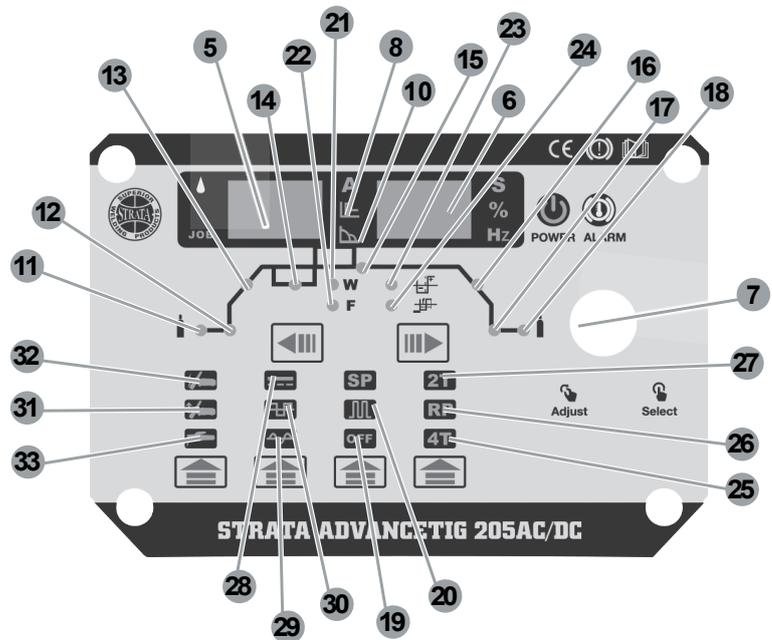
## Know Your Machine

More detailed explanations of function on following pages.

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

### Control Panel

5. LH Multifunction Display
6. RH Multifunction Display
7. Parameter Select/ Adjust Knob
8. MMA Hot Start Setting Indicator
9. MMA Welding Current Indicator
10. MMA Arc Force Setting Indicator
11. Pre Gas Flow Setting Indicator
12. Start Current Setting Indicator
13. Up Slope Setting Indicator
14. Tig Peak Welding Current Setting Indicator
15. Tig Base Welding Current Setting Indicator
16. Down Slope Setting Indicator
17. End Current Setting Indicator
18. Post Gas Flow Setting Indicator
19. Pulse Mode 'Off' Indicator
20. Pulse Mode 'On' Indicator
21. Pulse Frequency Setting Indicator
22. Pulse Width Setting Indicator
23. Clean Width Area/ AC Balance Adjustment
24. AC Frequency Adjustment
25. 4T Trigger Mode Indicator
26. Repeat Trigger Mode Indicator
27. 2T Trigger Mode Indicator
28. DC Output Indicator
29. AC Sine Wave Output Indicator
30. AC Advanced Square Wave Output Indicator
31. Lift TIG Mode Indicator
32. HF TIG Mode Indicator
33. MMA Mode Indicator





## Further Controls Explained

### LH Digital Multifunction Display (5)

Before welding this displays the setting selected/being adjusted using the control knob (7). During welding it displays welding current. The parameter setting displayed is indicated by the LEDs below the display; percentage (%), Current (A), Time (S) 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 (7)

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 the knob.

### Error Indicator

Lights when over voltage, over current 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.

## MMA Settings

### Hot start (8)

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 (10)

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

### Pre Flow (11)

Pre-flow 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 (12)

Available in 4T trigger mode only, sets a welding current 5-100% of the main welding current activated when the trigger is held on to 'latch' the trigger before the main weld current is started. Once the trigger is released, the current will go through the upslope (13) period if it is set, to the main welding current (14).

### Up Slope (13)

When the trigger is activated, the welding current will increase gradually over the time selected up to the set main welding current (14).

### Down Slope (16)

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.



## ADVANCETIG 205AC/DC

### End Current Setting (17)

Available in 4T trigger mode only, sets a welding current 5-100% of the main welding current activated when the trigger is held on to 'unlatch' the trigger before the weld is finished. If downslope (16) 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 (18)

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

Only available when pulse mode (20) is selected.

#### Base Current (15)

Sets the current of the low/ base pulse.

#### Pulse Frequency (21)

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

#### Pulse Width (22)

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 mode (29,30,31)

#### Clean Width Area/ AC Balance Adjustment (23)

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.

Ideally for maximum effectiveness, the clean width/ AC balance should be set with as much forward cycle bias as possible, while still maintaining a sufficient level of oxidisation 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, allowing use of a pointed tungsten tip shape for a more defined arc.

#### AC Frequency Adjustment (24)

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.

### TIG 2T/4T Trigger Control

#### 2T Mode (27)

The trigger is pulled and held on to activate the welding circuit, when the trigger is released, the welding circuit stops.

#### 4T (25)

This 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. The AdvanceTig 205 ACDC also has more current control options that can be used in 4T mode.



## ADVANCETIG 205AC/DC

### Repeat Mode (26)

Cycles between peak (14) and base (15) welding current set, each time the trigger is activated. Also uses upslope (13) and down slope (17) when changing between the peak and base current settings. The number of cycles repeated before the arc stops is set on the LH display (5) when the repeat mode indicator (26) is lit.

## AC/DC Output Modes

### DC (Direct Current) Welding Output (28)

Suitable for TIG welding ferrous (iron based) metals such as mild steel and stainless steel, copper and titanium. 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 Sine Wave Welding Output (30)

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

### AC Square Wave (31)

Focused arc for maximum penetration, fast travel speed with best directional control.

## TIG Arc Starting Modes

### TIG HF/ Lift ignition modes (32/33)

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 work piece, 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.



## ADVANCETIG 205AC/DC

### Tips and 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 205AC/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 205AC/DC can also be used with the Strata Wireless remote control system. Refer to the accessories section in this manual for the options available.

#### 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 Connection

Strata Advance Multivoltage technology allows the machine to operate on a very wide range input voltages down as low as 90V. This means that limited capacity power supplies and long extension leads may be used without damaging the welder. However, as the supply voltage decreases, the maximum output current and duty cycle will also decrease.

To utilise the full output capacity of the machine using an extension cord, it should be a heavy duty version with a minimum cable core size of 2.5mm<sup>2</sup>. It is recommended to use the Euroquip industrial duty 15A extension lead, part number; 16895.

### 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 205AC/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 (3) 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 (1).

*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 to MMA welding mode (34)
- 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 (1). 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 Insert TIG torch power connection into the negative welding power output socket (3). Connect TIG torch remote plug to remote socket (4) and torch gas connection to the TIG gas outlet (2).
- 2.3 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 the welding mode to 'Lift TIG' (32) or 'HF TIG' (33).
- 2.4 Assemble female gas quick connector to the gas line and regulator outlet fitting. Connect gas regulator to a gas cylinder (not included with machine) and connect female quick connector to male gas inlet on rear of 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 pressure with the torch triggered as static gas flow setting may drop once gas is flowing.

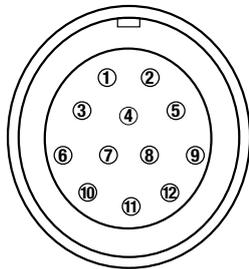
- 2.5 Set welding parameters as required following the instructions in the previous section. You are now ready to weld!



# ADVANCETIG 205AC/DC

## 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 205AC/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 205 AC/DC:			
7371	Pro-Grip 26 Torch x 25Ft, Tgc End (Large Dinse) M12, 10K Pot and 12 Pin Hizone Plug	TT24-150	Thoriated Tungsten Electrode 2.4mm (3pk)
		TT32-150	Thoriated Tungsten Electrode 3.2mm (3pk)
17399	Strata TIG Wireless Foot Control	TZ16-150	Zirconiated Tungsten Electrode 1.6mm (3pk)
17400	Strata TIG Remote Control Panel	TZ24-150	Zirconiated Tungsten Electrode 2.4mm (3pk)
17401	Strata TIG Foot Control	TZ32-150	Zirconiated Tungsten Electrode 3.2mm (3pk)
AAL3550	Arc Lead 16mm <sup>2</sup> cable, 35-70mm Plug, 4m	ACDCKIT	ACDC Tig Starter Kit - WP17, WP18, WP26
AEL3550	Earth Lead 16mm <sup>2</sup> cable, 35-70mm Plug, 3m	TR16MS-70S-6	Mild Steel Tig Rod 1.6mm/ 1kg
17403	Strata Water Cooling Unit 230V	TR24MS-70S-6	Mild Steel Tig Rod 2.4mm/ 1kg
17384	Strata Compact Welding Machine Trolley	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
ALS3550	MMA Lead Set 300A 3+3m 1/2" Dinse Connectors	TR32SS-316	Stainless Steel Tig Rod 3.2mm
S400EH	400A Screw Type Elect.Holder	TR16AL-5356	Aluminium Tig Rod 1.6mm/ 0.5kg
S500EC	Strata 500A 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
SV3000	Elite 4 Sensor Welding Helmet	TZ16-150	Zirconiated Tungsten Electrode 1.6mm (3pk)
SV4000	Auto Darkening Helmet, Shade level 4-13, One-touch external GRIND mode selection.	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.	HY26GP5KG	GP electrodes 5kg 2.6mm 6013
		HY32GP5KG	GP electrodes 5kg 3.2mm 6013
GR101AR	Argon Twin Gauge Regulator	HY40GP5KG	GP electrodes 5kg 4.0mm 6013
GR101ARFL	Argon Gas Regulator c/w Flow Meter	HY26LH5KG	Low hydrogen electrodes 5kg 2.6mm 7018
GR101AR-2FL	Argon Regulator c/w Twin Flow Meter	HY32LH5KG	Low hydrogen electrodes 5kg 3.2mm 7018
16895	15m H/D 15A Extension Lead (3x2.5mm <sup>2</sup> wiring)	HY40LH5KG	Low hydrogen electrodes 5kg 4.0mm 7018
TBC57Y02	Long Black Cap	PDL15	Plug, 3 Pin 15A 250V - Straight
TC10N23	Collet 1/16" (1.6mm) (2 pk)	17844	Gas Inlet QC
TC10N24	Collet 3/32" (2.4mm) (2 pk)	17847	12 Pin Strata TIG Remote Connector Plug
TC10N25	Collet 1/8" 3.2mm (Pkt 2)		
TCB10N31	Collet Body 1/16" (1.6mm) (2pk)		
TCB10N32	Collet Body 3/32" (2.4mm) (2pk)		
TCB10N28	Collet Body 1/8" (3.2mm) (2 pk)		
TCC10N48	Std. Ceramic Cup 3/8" Bore #6 (2pk)		
TCC10N47	Std. Ceramic Cup 7/16" Bore #7 (2pk)		
TCC10N46	Std. Ceramic Cup 1/2" Bore #8 (2pk)		
TCC10N45	Std. Ceramic Cup 5/8" Bore #10 (2pk)		
TT16-150	Thoriated Tungsten Electrode 1.6mm (3pk)		

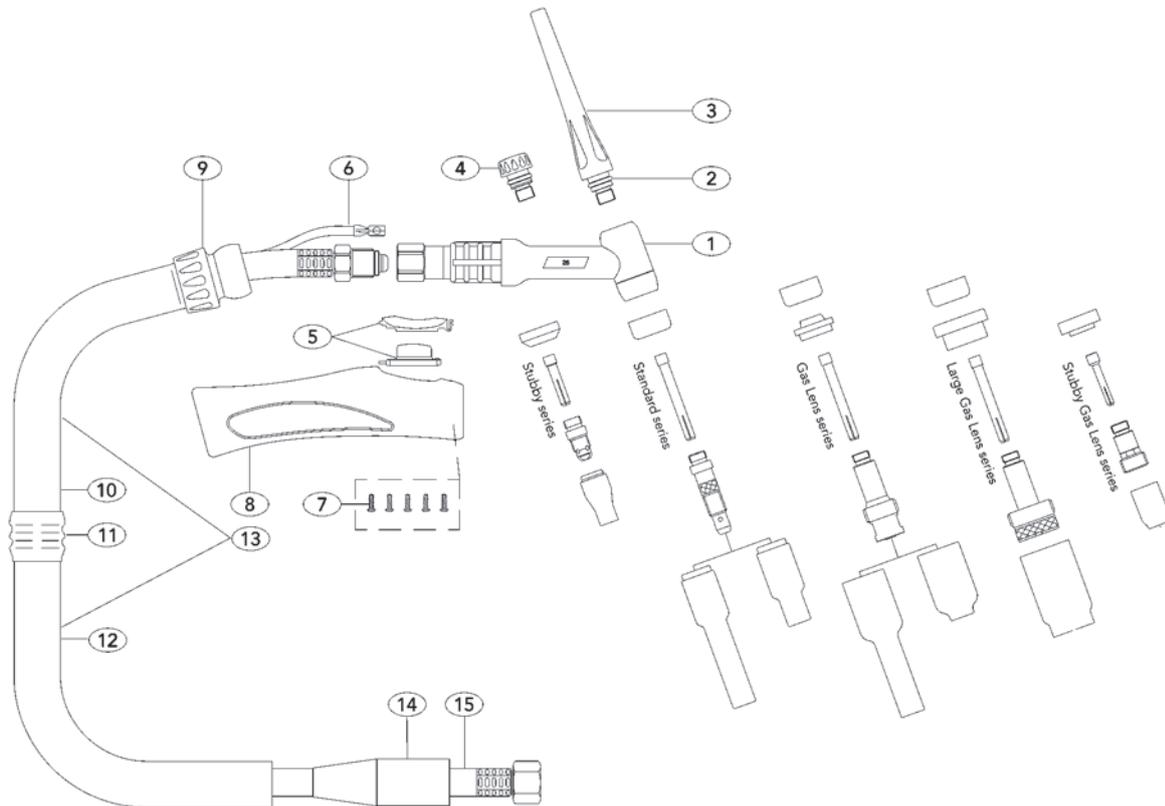


# ADVANCETIG 205AC/DC

## Suregrip™ Series WP26 Torch Parts

3.	TCB57Y02	Back Cap Long
4.	TCB57Y04	Back Cap Short
5.	TER1MS	Momentary Kit
6.	UERSWL8	Trigger Lead 25ft
8.	TERH200	Large Ergo Tig Handle
9.	UERKJ200	Large Knuckle Joint
11.	UERJK200	Jointing Repair Kit
13.	UERC0200-40	Sheath x 12.5ft Inc Leather Cover
	UERC0200-80	Sheath x 25ft Inc Leather Cover
15.	46V28	Power Cable x 12.5ft Rubber
	46V30	Power Cable x 25ft Rubber

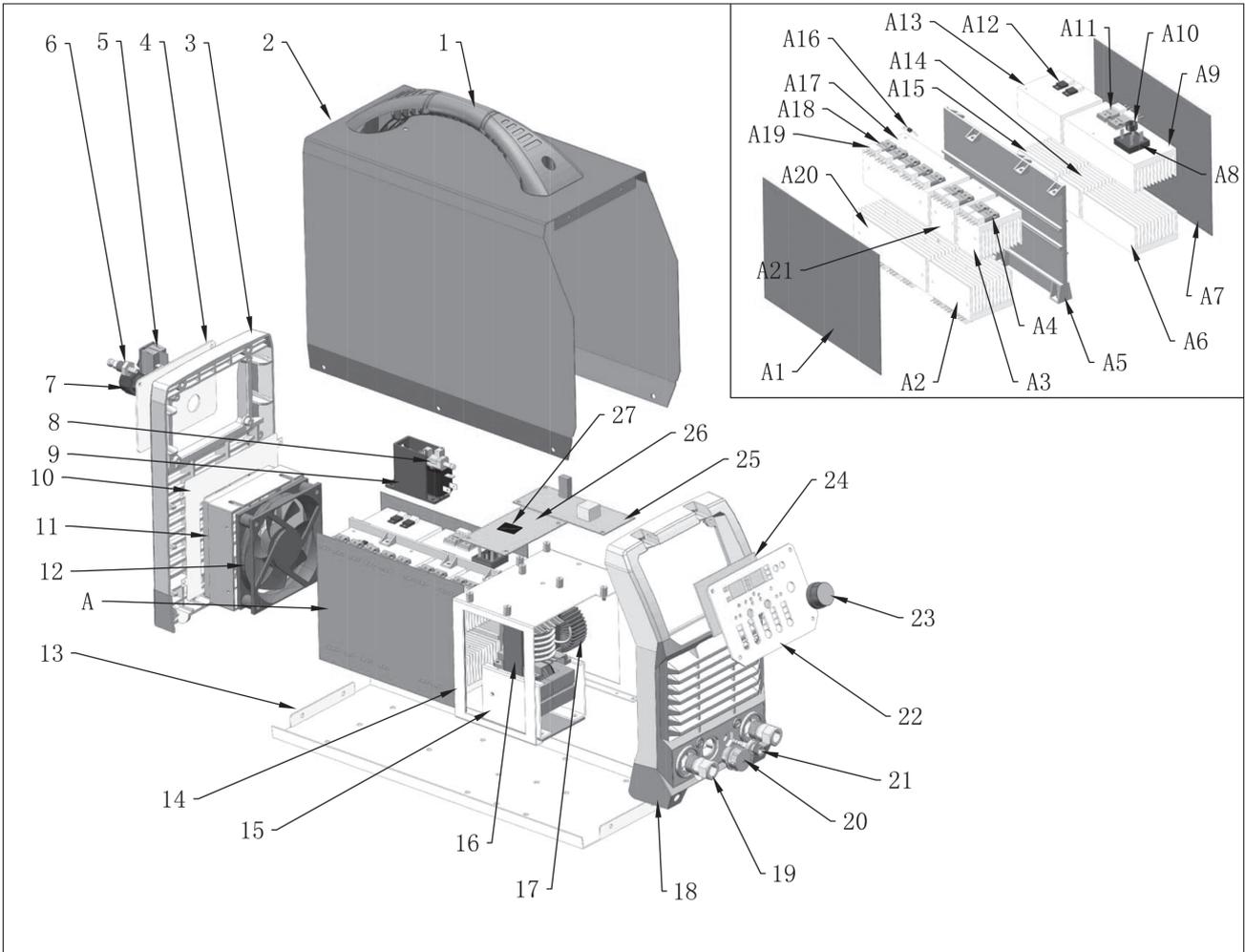
All products conform to EN60974-7 and are RoHS, REACH and WEEE compliant





# ADVANCETIG 205AC/DC

## Part Diagram



No.	Description	No.	Description	No.	Description	No.	Description
1.	Handle	15.	HF inductance	A1.	Secondary inverter PCB	A15.	Heat sink
2.	Machine cover	16.	Main transformer	A2.	Heat sink	A16.	Thermistor
3.	Rear panel	17.	PFC inductance	A3.	Heat sink	A17.	Heat sink
4.	Rear panel mounting sheet	18.	Plastic front panel	A4.	IGBT	A18.	Fast recovery diode
5.	On and off switch	19.	35~70SQ Euro socket	A5.	Middle plate	A19.	Insulation block
6.	Gas inlet	20.	12 pin socket	A6.	Heat sink	A20.	Heat sink
7.	Cable clamp	21.	Gas inlet	A7.	Primary inverter PCB	A21.	Heat sink
8.	Solenoid valve	22.	Control PCB mounting board	A8.	Rectifier bridge		
9.	Valve mounting case	23.	Knob	A9.	Heat sink		
10.	Fan mounting board	24.	Display PCB	A10.	Screw cap		
11.	Fan cover	25.	Power PCB	A11.	IGBT		
12.	Fan	26.	Control PCB	A12.	Fast recovery diode		
13.	Base panel	27.	Wireless PCB	A13.	Heat sink		
14.	Support pillar	28.	Hull sensor	A14.	Heat sink		



## Care & Maintenance

### Keep your Welding Machine in Top Condition

The ADVANCETIG 205AC/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 serial number at the rear of this manual 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.

### 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.

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.

### 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 (GWAW) (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(GWAW) (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 205AC/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 205AC/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

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