

/ Perfect Welding / Solar Energy / Perfect Charging



SHIFTING THE LIMITS

MAGICWAVE 4000 / 5000 TRANSTIG 4000 / 5000

/ TIG & MMA welding



**ACTIVE WAVE
TECHNOLOGY**



ACTIVE WAVE TECHNOLOGY BOOSTS PROFITABILITY:

/ Whole system is totally digitised: Power source, welding torches, remote-control units, robot interfaces, PC tools.

/ Digital signal processor (DSP) regulates and controls the welding process.

/ Available in both "Standard" and "Job" versions. "Job" offers extra functions such as job-mode, and supports cold-wire control and automated applications.

/ TAC function for faster tacking of materials.

/ Exceedingly high arc stability, even on aluminium base metals from which the oxide has been completely removed; no instability (verifiably so)!

/ Special program for aluminium: Automatic shaping of the cap on the pointed electrode tip, for perfect root fusion.

/ Series feature: If welding is performed with two power sources, both arcs are synchronised to permit simultaneous welding on both sides.



WELDING PROPERTIES

SIMULTANEOUS WELDING ON BOTH SIDES

/ When joining plates, you normally have to weld a root pass first. This then has to be ground and back-welded – a time-consuming procedure which you can speed up by welding from both sides simultaneously. In “both-sidessimultaneously” TIG-AC welding, both arcs have to be synchronised. And to help you do this, the MagicWave power sources have a “SyncMode” function which harmonises both the arcs.

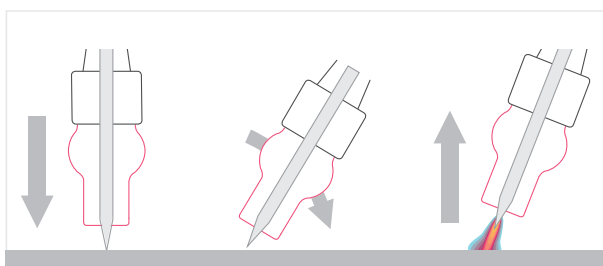


ALL'S WELL THAT ENDS WELL

/ A perfect start needs to be followed by a perfect finish. At the end of the weld, there are two main things to watch out for: The first of these is the gas post-flow, to make sure that the electrode and the weld-pool do not oxidise. In the past, the gas post-flow had to be set manually. On the digital machines, the ideal post-flow time is computed automatically. The second thing is the end crater. This has to be filled, at a lower amperage. The new power sources take care of this, too, with the craterfill and downslope function.

SIMPLY PERFECT

/ We'll start with the ignition, which plays a key rôle in TIG welding. On each of the machines, ignition is possible either with or without touchdown. In non-contact ignition, the arc starts immediately with a high-voltage impulse, ensuring perfect ignition right from the first push of the button - even when using extra-long hosepacks. Touchdown ignition is especially valuable in sensitive areas of application. And the important thing here is to make sure that there are no tungsten inclusions. The digital process control takes good care of this, perfectly controlling the entire sequence.



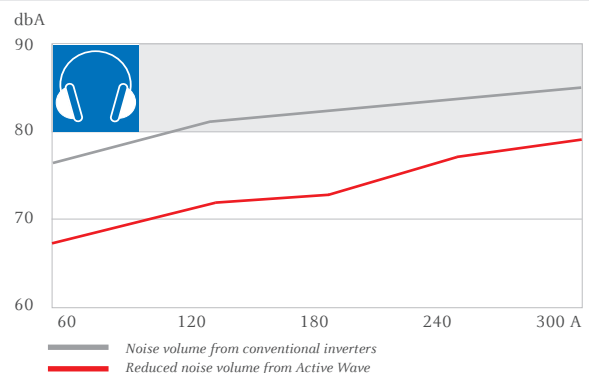
/ For sensitive areas of application: Touchdown ignition

TAC: SPOT-BY-SPOT TACK WELDING

/ Before you can weld, you have to tack. The usual way of doing this is to merge the two weld-pools by making a slight movement with the torch. With TAC, one spot is all it takes. And so on. And the one after that. And so on. Because with TAC, the arc during tacking is not continuous, but pulsed. And this prompts the two weld-pools to “jump together”, in next to no time, to make one single weld-pool. This works fast, and is a lot easier than the old method. The TAC function is also very useful when light-gauge sheets are being welded without filler metal, as it helps the weld-pools to merge more thoroughly.

ACTIVE WAVE ENSURES PEACE AND QUIET

/ From now on, TIG AC welding will be a much quieter business - with a much quieter arc. All thanks to Active Wave: The integrated digital signal processor always computes - in real time - the waveform that will permit the highest possible arc stability with the lowest possible noise-emission levels. Measurement of these noise levels clearly shows that with Active Wave, even when the machine is delivering 300 A of power, the dbA value is still below 80 dbA. If you're not a welder yourself, and want to know how important this development is, then just ask one!





FLEXIBLE WORKPLACES

/ Remote control units are really practical. They come in especially handy for welders, because they let you intervene in the welding process and change parameters directly at the scene of the action. No matter where your welding machine happens to be. Special mention should be made here of the JobMaster TIG welding torch, which comes with integral remote control. This lets you call up all your settings, any time and anywhere, regardless of where the machine is standing. The JobMaster TIG welding torch features a digital parameter display, job recall and freely selectable parameters, meaning that you decide for yourself which parameters you want to alter during welding.

/ A few more words on the torch: Particularly advantageously for TIG welding, this comes with a leather hose, whose much greater flexibility means that the welder only has a

smaller proportion of the total weight of the torch to carry with him while he works. The torch also has an ergonomically shaped handle and a swivel-mounted hosepack. Another great feature is the torch central connector F++, with a separate water connector so that there is absolutely no way that any coolant can get into the gas channel and cause porosity in the weld metal.

/ Different types of job call for different types of welding torch. Which is why there is a special one for robot applications, with an integrated cold-wire feeder unit. Or a special cold-wire torch for manual welding with an integrated wire-feed – used mainly for series applications with good accessibility. By the way, the cold-wire control system, complete with all parameters, is already integrated in the power source.

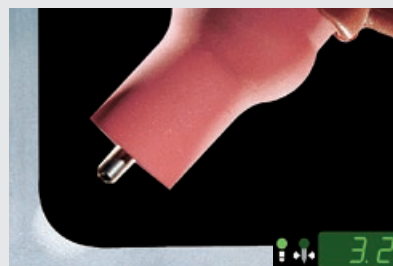
SPECIAL PROGRAM FOR ALUMINIUM

/ Aluminium always needs special treatment. So Fronius have made sure that it gets it. For example, in TIG AC welding, aluminium is normally not welded with a pointed electrode tip, but with a shaped cap at the tip of the electrode. On fillet welds, this leads to inadequate root fusion. The MagicWave machines use a pointed electrode with a much smaller shaped cap, and with perfect root fusion as a result.

/ The cap is shaped automatically, by the way, which means huge time-savings. All you need to do is clamp the pointed electrode into the electrode holder and preselect the cap diameter, and the arc then immediately forms the shape and size of cap that you want. Another interesting function enables you to make variable adjustments to the AC waveform, giving the welder reliable weld-pool control even at high amperages.



Cap diameter: 1 mm
Base metal: AlMg3
Sheet thickness: 5 mm
Welding amperage: 185 A
Welding voltage: 15.6 V
AC Balance: -5



Cap diameter: 3.2 mm
Base metal: AlMg3
Sheet thickness: 5 mm
Welding amperage: 185 A
Welding voltage: 15.6 V
AC Balance: 0

MATERIALS

- / Aluminium and its alloys
- / Non-ferrous metals
- / Low and high-alloy steels

APPLICATIONS

- / Manual welding
- / Robot welding

INDUSTRIAL SECTORS

- / Construction of chemical plant, tanks and vessels, machinery and plant
- / Automotive engineering and construction of railway rolling stock
- / Aerospace
- / Site-erection contractors, maintenance and repair firms
- / Pipeline construction
- / Shipbuilding



/ For cold-wire applications: TTW 4000 KD welding torch with integrated remote-control, display and wirefeed unit



/ TR 2200 F remote-control pedal unit: For precision control of the welding amperage at all times



/ JobMaster TIG welding torch with integrated remote-control and display

CHECKLIST

Digital weld-process control	●	●	●	●
Microprocessor control	●	●	●	●
Energy-saving inverter technology	●	●	●	●
Generator-compatible	●	●	●	●
Thermostat-controlled fan / overtemperature protection	●	●	●	●
Earth leakage monitoring	●	●	●	●
Continuous welding-current adjustment from torch	●	●	●	●
Remote-controllable	●	●	●	●
Switchover facility between touchdown and HF ignition	●	●	●	●
Automatic gas post-flow (dep. on welding current)	●	●	●	●
Gas-test function	●	●	●	●
Automatic cooling-unit cut-out	●	●	●	●
Anti-stick function	●	●	●	●
Anti-stick function	●	●	●	●
Job mode		●		●
Automatic cap-shaping function	●	●		
Polarity reversal	●	●		
RPI ignition	●	●		
Keylock switch	○	○	○	○
Rate-of-flow watchdog for torch cooling system	○	○	○	○
External current-flow signal	○	○	○	○
Robot interface, analogue/digital		○		○
Cold-wire control		○		○

DIGITAL INDICATION OF

Run-status	●	●	●	●
Operating mode	●	●	●	●
Welding voltage, welding amperage (actual value)	●	●	●	●
"Hold" function	●	●	●	●
Overtemperature	●	●	●	●
Service code	●	●	●	●
Mains voltage monitoring	●	●	●	●
Job number		●		●

ADJUSTABLE PARAMETERS

Welding power (continuously adjustable)	●	●	●	●
Electrode diameters	●	●	●	●
Gas pre-flow time / gas post-flow time	●	●	●	●
Crater-fill current / start-arc	●	●	●	●
UpSlope / DownSlope	●	●	●	●
Hot-Start / arc-force dynamic	●	●	●	●
AC balance / AC frequency / AC waveform	●	●		

OPERATING MODES

2-step mode / 4-step mode	●	●	●	●
TAC (programmed tack-welding)	●	●	●	●
AC / DC	●	●		
Special 4-step mode		●		●
TIG-Puls		●		●
Spot welding		●		●

- MW
 - MW Job
 - TT
 - TT Job
- as standard
○ optional



/ TransTig control panel



/ MagicWave "Job" control panel

QUALITY AT THE PUSH OF A BUTTON

/ Even welding systems with very wide-ranging functionality ought to be easy to operate. And it is just this which is yet another big strength of the Fronius systems. The extensive know-how stored in the systems can be intuitively retrieved, and the control panels are self-explanatory and straightforward. What is more, there is a choice of two dif-

ferent control panels for this series of machines: Standard or Job. The "Job" control panel offers additional functions such as job mode, and enables cold-wire control and automated applications.

A COMPLETE SYSTEM, FROM THE ROBOT INTERFACE ALL THE WAY THROUGH TO THE TIG WELDING TORCH

/ Fronius is a system supplier. Each member of the system is designed to "fit in" optimally with all the others, in perfect harmony. It takes in everything from modularly designed power sources (available for both gas and water-cooled torches, incidentally), to remote-control units, cooling units, trolleys and a wide range of different robot interfaces, as well as complete welding-data documentation and visualisation.



/ MagicWave 5000 and Robacta TTW 4500 robot welding torch with Robacta KD-Drive cold-wire feeder unit

TECHNICAL DATA

POWER SOURCE	MAGICWAVE 4000 TRANSTIG 4000	MAGICWAVE 5000 TRANSTIG 5000
Mains voltage	3 x 400 V	3 x 400 V
Mains voltage tolerance	-15 / +15%	-15 / +15%
Mains fuse protection (slow-blow)	35 A	35 A
Primary continuous current (100 % d.c.)	15.5 kVA ¹	17.9 kVA ²
Cos phi	0.99	0.99
Welding current range TIG	3 - 400 A	3 - 500 A
MMA	10 - 400 A	10 - 500 A
Welding current at: 10 min/40°C (104 °F) 40% d.c.	-	500 A
10 min/40°C (104 °F) 45% d.c.	400 A	-
10 min/40°C (104 °F) 60% d.c.	365 A	440 A ⁷
10 min/40°C (104 °F) 100% d.c.	310 A	350 A
Open-circuit voltage	86 V	86 V
Working voltage TIG	10.1 - 26.0 V	10.1 - 30.0 V
MMA	20.4 - 36.0 V	20.4 - 40.0 V
Ignition voltage (Up)*	9.5 kV	9.5 kV
Degree of protection	IP 23	IP 23
Type of cooling	AF	AF
Insulation class	F	F
Dimensions L / W / H (with handle)	625 / 290 / 705 mm ³ 24.6 / 11.4 / 27.8 in ⁴	625 / 290 / 705 mm ³ 24.6 / 11.4 / 27.8 in ⁴
Weight	58,2 kg ⁵ 128 lb ⁶	58,2 kg ⁵ 128 lb ⁶

CE **S** IP 23 *The arc ignition feature is suitable for manual operation.

¹ On the TT 4000: 11.8 kVA

³ On the TT 4000/5000: 39.8 kg

² On the TT 5000: 15.1 kVA

⁴ On the TT 4000/5000: 87.7 lb

³ On the TT 4000/5000: 625x290x475 mm

⁷ On the TT 5000: 450 A

⁴ On the TT 4000/5000: 24.6x11.4x18.7 in

WELDING TORCH	TTW 4000 A	TTW 5000 A
Welding current AC	350 A	400 A
DC	400 A	500 A
Duty cycle	60%	60%
Electrode diameters	1.0 - 4.0 mm	1.6 - 6.4 mm
Weight	0.96 kg / 2.1 lb	0.985 kg / 2.2 lb

COOLING UNIT	FK 4000 R
Cooling capacity at Q = 1l / min.	+40 °C (104° F) / 1000 W
Max. delivery rate	3.5l / min
Coolant volume	5.5 l
Degree of protection	IP 23
Dimensions L / W / H	700 / 280 / 250 mm 27.6 / 11.0 / 9.8 in
Weight (without coolant)	16,3 kg / 38.9 lb

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WE HAVE THREE DIVISIONS AND ONE PASSION: SHIFTING THE LIMITS OF POSSIBILITY.

/ Whether welding technology, photovoltaics or battery charging technology – our goal is clearly defined: to be the innovation leader. With around 3,300 employees worldwide, we shift the limits of what's possible - our record of over 900 granted patents is testimony to this. While others progress step by step, we innovate in leaps and bounds. Just as we've always done. The responsible use of our resources forms the basis of our corporate policy.

Further information about all Fronius products and our global sales partners and representatives can be found at www.fronius.com

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Fronius Canada Ltd.
2875 Argentia Road, Units 4,5 & 6
Mississauga, ON L5N 8G6
Canada
Telephone +1 905 288-2100
Fax +1 905 288-2101
sales.canada@fronius.com
www.fronius.ca

Fronius USA LLC
6797 Fronius Drive
Portage, IN 46368
USA
Telephone +1 877 FRONIUS
sales.usa@fronius.com
www.fronius-usa.com

Fronius UK Limited
Maidstone Road, Kingston
Milton Keynes, MK10 0BD
United Kingdom
Telephone +44 1908 512 300
Fax +44 1908 512 329
info-uk@fronius.com
www.fronius.co.uk

Fronius International GmbH
Froniusplatz 1
4600 Wels
Austria
Telephone +43 7242 241-0
Fax +43 7242 241-953940
sales@fronius.com
www.fronius.com