MagicWave 2500 / 3000
TransTig 2500 / 3000

TIG & MMA welding

Fronius

PERFECT WELDING

Welding made easy

GENERAL REMARKS

Quiet, tough, stable

TIG welders can raise a heartfelt cheer! Specially for them, Fronius has developed a series of machines that make their every wish come true: MagicWave 2500/3000 for DC and AC, and TransTig 2500/3000 for DC. Active Wave and digitisation are the key technologies underlying this machine concept.

These power sources are up-to-the-minute characters that are a pleasure to work with, in every way: Ever-so discreet, with a super-quiet yet highly stable arc. Extremely straightforward to use - in fact, almost self-explanatory. Tough, powerful and totally digitised. What is more, every single one of them is a member of a complete, totally co-ordinated welding system, all of whose components perfectly complement one another. All in all, the upshot is the sort of welding results which up to now you could only dream of.

UTILISATION

Flexible and versatile

One of the many things that make the new MagicWave and TransTig machines such a pleasure to work with is the fact that they are designed for both field and production use. They can cope with the toughest conditions imaginable, putting out up to 250/300 A of power.

In terms of materials, these welding systems are very suitable for aluminium and its alloys, but also for low and high-alloy steels and non-ferrous metals, of course. Thanks to their great versatility, the MagicWave 2500/3000 and TransTig 2500/3000 are used right across the entire spectrum of industry – from the construction of chemical plant, tanks and containers to mechanical and plant engineering, pipeline construction, automotive and railway engineering and aerospace, and taking in all site-erection, maintenance and repair firms. Delivering just as perfect results when used for robot welding as in manual welding.

ECONOMY

A pleasing side-effect

This series of TIG machines is a fine example of just how efficient modern welding systems can be. Their efficiency begins with the high-grade componentry that is used for all Fronius machines. Special mention should also be made of their high degree of power efficiency, extremely low open-circuit power, automatic cooling-unit cut-out (which has a direct and measurable impact on the current consumption), and of course the automatic cap-shaping function, which reduces the working times needed by the welder. All in all, these features result in outstandingly long operational life, a small number of wearing parts, and lower labour costs. And thus in a welding system that is highly cost-effective in every way.

TIG robot welding system with integral cold-wire-feeder unit.

FACTS

Active Wave technology boosts cost efficiency:

- 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 3 versions: Standard, Job and Comfort. “Job” offers extra functions such as job-mode, and supports cold-wire control and automated applications, while the “Comfort” version features a plain-text display and extreme ease of operation.
- Special program for aluminium: Automatic shaping of the cap on the pointed electrode tip, for perfect root fusion.
- TAC function for faster tacking of materials.
- As standard: If welding is performed with two power sources, both arcs are synchronised to permit simultaneous welding on both sides.
- By automatically adapting to different mains voltages, “Multivoltage” ensures worldwide useability.

UTILISATION

Materials

- Aluminium and its alloys (with MagicWave)
- Non-ferrous metals
- Low and high-alloy steels

Applications

- Manual welding
- Robot welding

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

The way welding ought to be

WELDING PROPERTIES

Simply perfect

The ignition plays a vital 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 you're 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.

Active Wave ensures peace and quiet

Active Wave makes TIG AC welding a much quieter business: 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.

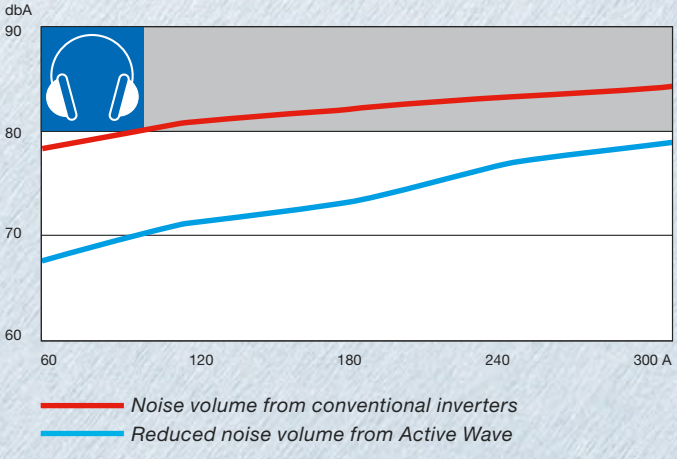
TAC: Spot-by-spot tack welding

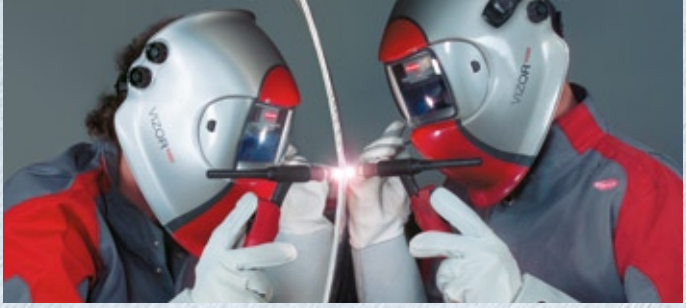
Before you can weld, you have to tack. With TAC, one spot is all it takes – because the pulsed arc sets the two weld-pools in motion, making them "jump together", in next to no time, to make one single weld-pool. This works fast, and is a lot easier than the old method. The TAC function is also very useful when light-gauge sheets are being welded without filler metal, as here too, the pulsed arc helps the weld-pools to merge more thoroughly.

Real skill becomes apparent at the end

At the end of the weld, there are two main things to watch out for: The first of these is the end crater. This has to be filled, at a lower amperage. The power sources take care of this, with the end-crater and downslope functions. The second thing 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.

For sensitive areas of application: Touchdown ignition





SAFETY

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-sides-simultaneously” TIG-AC welding, both arcs have to be synchronised. This is taken care of by the digital MagicWave power sources.

Aluminium is different

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. This results in perfect root fusion.

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 pre-select 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.

Green lights all round

As anybody at all familiar with Fronius machines will know, their safety features are second to none. This, in itself, is a minimum requirement that every appliance has to fulfil. Every power source comes with the CE mark and with the S mark – permitting welding in confined spaces in conditions of enhanced electrical hazard, also when AC welding, of course. What is more, each of the power sources amply fulfils the requirements of IEC “Degree of protection IP 23”, meaning that it is safely protected from dirt and water, for use in the field. The integral fan is thermostat-controlled and so only runs when it is needed. This reduces dirt collection and prolongs the service life of the power source. At Fronius, though, safety starts even sooner: in the development stage. The MagicWave and TransTig machines were designed from the ground up to be so robust and compact that they can take just about anything in their stride.

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

Anything else we can do for you?

HANDLING

Small on size, big on quality – the ideal welding torch for this power class

Of all the components of the welding system that execute a work function, the welding torch is the most important. You can have the world's most advanced power source and its very best welder – but if the hosepack is under constant strain, it will still spoil the welding result. Fronius is well aware of this, too. Which is why it is continually developing and improving its welding torches – for instance by adding the water-cooled TIG-welding torch TTW 2500, for the power class up to 250 A.

Its ergonomically designed handle-shell is smaller and so fits even better in the welder's hand - in fact, it can even be held like a pencil. The up/down rockers are easy to actuate while wearing gloves. The handle-shell also integrates a perfect anti-kink feature: The hosepack flexes more quickly, resulting in more precise torch guidance. Importantly for uninterrupted water cooling, the hosepack itself cannot be endlessly rotated. A final, economic, argument is that the wearing parts from other Fronius welding torches are all compatible with the TTW 2500.

For the power class up to 300 A, other Fronius welding torches can be used as well, of course. Mention should also be made of the TIG welding torch with its integral cold-wire feeder unit for manual and automated cold-wire applications.

Perfect interplay

Fronius is a system supplier. Each member of the system is designed to "fit in" optimally with all the others, in perfect harmony. The system takes in everything from the power source to remote-control units, cooling units, trolleys and a wide range of different robot interfaces, as well as complete welding-data documentation and visualisation.

The water-cooled TIG welding torch TTW 2500, with integral up/down rockers.

Thanks to its ergonomically shaped handle-shell, the welding torch fits superbly well in the welder's hand. The perfectly integrated anti-kink device enables the torch to be guided with great precision, even when the hosepack is bent.

Control panel of TT 2500 Standard

Control panel of MW 2500 Job

Control panel of MW 3000 Comfort

All plain to see

The machines in this series are available in three different versions – Standard, Job and Comfort, each with differing functions. “Job”, for instance, lets you work in job mode and allows cold-wire control and automated applications.

The “Comfort” model also includes a number of extra plus-points, such as the plain-text display. This is unique, in terms of both handling guidance and user-friendliness, and ranks at the very forefront of modern technology. It functions extremely simply and “tells it like it is”, in plain text. That means no abbreviations, no numerical codes, just straight-to-the-point announcements like “Main current”, “Lowered current” or “Electrode diameter”. The additional parameters can be set very conveniently using a navigation menu. The plain-text display is easy to read and absolutely self-explanatory, meaning that anyone can learn to use it straight away. The “Comfort” control panel lives up to the usual high Fronius standards, and is easy to operate even when wearing gloves.

The plain-text display on the “Comfort” models makes the machines easier to operate by showing whole words, in a choice of languages, and by visualising the functional sequence. Additional parameters can be set very conveniently, by way of navigable menus.

CHECKLIST

	MW	MW Job	MW Comfort	TT	TT Job	TT Comfort
Digital weld-process regulation and 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	●	●	●	●	●	●
Freely selectable parameters on the welding torch		●	●		●	●
Job mode		●	●		●	●
Automatic cap-shaping function	●	●	●			
Polarity reversal	●	●	●			
RPI ignition	●	●	●			
Keylock switch	O	O	O	O	O	O
Robot interface, analogue / digital		O	O		O	O
Cold-wire control		O	O		O	O
Operating modes						
2-step mode / 4-step mode	●	●	●	●	●	●
TAC (programmed tack-welding)	●	●	●	●	●	●
AC / DC	●	●	●			
Special 4-step mode		●	●		●	●
TIG pulsed-arc		●	●		●	●
Spot welding		●	●		●	●
Digital indication of						
Plain-text display			●			●
Run-status	●	●	●	●	●	●
Operating mode	●	●	●	●	●	●
Parameters	●	●	●	●	●	●
Welding voltage, welding amperage (actual value)	●	●	●	●	●	●
Service codes	●	●	●	●	●	●
Job number		●	●		●	●
Adjustable parameters						
Welding amperage	●	●	●	●	●	●
Electrode diameter	●	●	●	●	●	●
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	●	●	●			

● as standard O optional

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TECHNICAL DATA

Power source	MW 2500	MW 2500 MV	MW 3000	MW 3000 MV	TT 2500	TT 2500 MV	TT 3000	TT 3000 MV
Mains voltage 50-60 Hz	3×400 V	3×200-240 V	3×400 V	3×200-240 V	3×400 V	3×200-240 V	3×400 V	3×200-240 V
		3×400-460 V		3×400-460 V		3×400-460 V		3×400-460 V
		1×200-240 V		1×200-240 V		1×200-240 V		1×200-240 V
Mains voltage tolerance	± 15 %	± 10 %	± 15 %	± 10 %	± 15 %	± 10 %	± 15 %	± 10 %
Mains fuse protection (slow)								
3×400 (460) V	16 A	16 A	16 A	16 A	16 A	16 A	16 A	16 A
3×230 V		32 A		32 A		32 A		32 A
1×230 V		32 A		32 A		32 A		32 A
Primary contin. power (100% d.c)								
3×400 (460) V	4.5 kVA	4.5 kVA	5.5 kVA	5.5 kVA	4.5 kVA	4.4 kVA	6.1 kVA	6.1 kVA
3×230 V		4.1 kVA		4.7 kVA		4.1 kVA		5.5 kVA
1×230 V		4.1 kVA		4.7 kVA		4.1 kVA		5.5 kVA
Cos phi 1	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Welding current three-phase TIG	3-250 A	3-250 A	3-300 A	3-300 A	3-250 A	3-250 A	3-300 A	3-300 A
MMA	10-250 A	10-250 A	10-300 A	10-300 A	10-250 A	10-250 A	10-300 A	10-300 A
Welding current single-phase TIG	3-220 A	3-220 A	3-220 A	3-220 A	3-220 A	3-220 A	3-220 A	3-220 A
MMA	10-180 A	10-180 A	10-180 A	10-180 A	10-180 A	10-180 A	10-180 A	10-180 A
Welding current at 10min/40 °C (104 °C)								
3×400 V	40% d.c. 250 A	40% d.c. 250 A	35% d.c. 300 A	35% d.c. 300 A	50% d.c. 250 A	50% d.c.250 A	50% d.c.300 A	50% d.c.300 A
3×460 V on MV	100% d.c. 170 A	100% d.c. 170 A	100% d.c. 190 A	100% d.c. 190 A	100% d.c. 190 A	100% d.c.190 A	100% d.c.240 A	100% d.c.240 A
3×230 V		35% d.c. 250 A		30% d.c. 300 A		45% d.c.250 A		45% d.c.300 A
		100% d.c. 160 A		100% d.c. 170 A		100% d.c.180 A		100% d.c.220 A
1×230 V		45% d.c. 220 A		40% d.c. 220 A		55% d.c.220 A		55% d.c.220 A
		100% d.c. 150 A		100% d.c. 150 A		100% d.c.170 A		100% d.c.190 A
Open-circuit voltage	89 V	89 V	89 V	89 V	85 V	85 V	85 V	85 V
Standardised working voltage TIG	10.1-20.0 V	10.1-20.0 V	10.1-22.0 V	10.1-22.0 V	10.1-20.0 V	10.1-20.0 V	10.1-22.0 V	10.1-22.0 V
MMA	20.4-30.0 V	20.4-30.0 V	20.4-32.0 V	20.4-32.0 V	20.4-30.0 V	20.4-30.0 V	20.4-32.0 V	20.4-32.0 V
Ignition voltage (Up)*	10 kV	10 kV	10 kV	10 kV	10 kV	10 kV	10 kV	10 kV
Type of cooling/insulation class	AF/B	AF/B	AF/B	AF/B	AF/B	AF/B	AF/B	AF/B
Dimensions LxWxH mm	560x250x435	560x250x435	560x250x435	560x250x435	560x250x435	560x250x435	560x250x435	560x250x435
Inches	22.0x9.8x17.1	22.0x9.8x17.1	22.0x9.8x17.1	22.0x9.8x17.1	22.0x9.8x17.1	22.0x9.8x17.1	22.0x9.8x17.1	22.0x9.8x17.1
Weight	26.6 kg	28.2 kg	28.1 kg	30.0 kg	24.2 kg	25.9 kg	24.2 kg	25.9 kg
	58.64 lb.	62.17 lb.	61.95 lb.	66.14 lb.	53.35 lb.	57.10 lb.	53.35 lb.	57.10 lb.

CE S IP 23 *The arc-ignition feature complies with the Standards governing manual operation.

Cooling unit	FK 2500 FK 2500 FC	FK 2500 MV FK 2500 MV FC
Mains voltage 50-60 Hz		200-240 V
	400 V	400-460 V
Mains voltage tolerance	± 10 %	± 10 %
Power consumption 50 Hz/60 Hz	0.6/0.7 A	0.6-1.4 A
Cooling capacity Q=1l/min +25 °C Cooling capacity Q=1l/min +40 °C	800 W 500 W	800 W 500 W
Max. delivery rate	3.5 l/min	3.5 l/min
Maximum rise 35 m	35 m (114.8 ft.)	35 m (114.8 ft.)
Max. pump pressure	4.2 bar (60.9 psi)	4.2 bar (60.9 psi)
Coolant volume	4 l (1.1 gal.)	4 l (1.1 gal.)
Degree of protection	IP 23	IP 23
Dimensions LxWxH	625x240x225 mm	625x240x225 mm
	24.1x9.4x8.9 in.	24.1x9.4x8.9 in.
Weight	9 kg (20 lb.)	11,6 kg (25.6 lb.)

Welding torch	TTW 2500	TTW 3000
Welding current AC	180 A	250 A
DC	250 A	300 A
Duty cycle	40 %	60 %
Electrode diameter	1.0-3.2 mm	1.0-3.2 mm
	0.039-0.126 in.	0.039-0.126 in.
Weight	0.47 kg (1.03 lb.)	0.75 kg (1.65 lb.)

Welding torch	TTG 2200	TTG 2600
Welding current AC	180 A	220 A
DC	220 A	260 A
Duty cycle	35 %	35 %
Electrode diameter	1.0-4.0 mm	1.0-4.0 mm
	0.039-0.157 in.	0.039-0.157 in.
Weight	0.96 kg (2.11 lb.)	0.57 kg (1.25 lb.)

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