FAQ-LIST | iWAVE MANUAL

Overview of FAQs in order to support the launch of iWave 300i-500i devices as well as FAQs all around the relaunch of existing TT/MW 190-230i power sources

1. Market introduction | iWave 300i-500i

- When will iWave 300i-500i be officially available and actively communicated?
  - Official Start-of-Sales and Start-of-Communication (start of external communication) is on the 19th January 2021. From this date on, the new products can be officially ordered and they will be actively promoted.

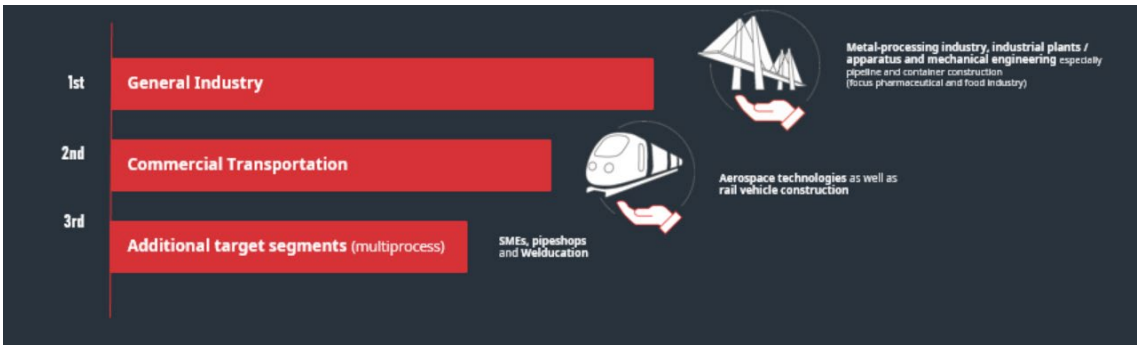
- What does „iWave“ stand for?
  - **„… the intelligent TIG power source for industrial applications and absolute quality on all weldable materials!"**
  - The „i“ in iWave symbolises the intelligence of the new generation and thus also the continuation of the “intelligent revolution” started with TPS/i.
  - In summary, we can say that iWave stands for ...
    - intelligent TIG High End power sources for industrial applications!
    - absolute quality and perfect weld seam on different materials!
    - networkable power sources with modularly expandable range of functions!
    - customisable systems for every welder and every application!
    - innovative functions and technology leadership!
    - future-proof and configurable complete welding solutions!

- What differs iWave and TT 170/210 power sources?
  - With these product families, we pursue a strongly differentiated market development strategy. While TT 170/210 power sources are products for the volume market and have been developed for the simple steel welding market, we clearly position ourselves in the high-end sector with iWave. iWave power sources are not only suitable for “simple” steel applications, but also guarantee absolute quality and perfect weld seams on a wide range of materials, even under the toughest industrial conditions (high duty cycle, shift operation, ...).

HIGH END iWave 190i-500i	LEAN TT 170/210
Intelligent Revolution (high-end, industry)	Professional Welding Tool (lean)
Manual up to automated applications – follows!	Only manual application
Gas- and water cooled	Only gas cooled
Focus: I. Welding properties (absolute quality) II. Industry 4.0 & connectivity III. Usability	Focus: I. Usability (simplicity) II. Mobility III. Welding properties
Function: / TIG DC and AC/DC / Performance-optimized / Extended range of functions & OPT/i's / Connectivity (Bluetooth, NFC, Wi-Fi) / Graphic-dynamic display with touch screen and plain-test display with rotary push button and 4 large buttons, ...	Function: / TIG DC / Cost-optimized / Reduced range of functions (simple steel market) / No connectivity / Display optimised for easy operation (7-segment display) / ...
/ Modular system → focus complete solution sales (direct sales)	/ No modularity → product sales (indirect sales)

- Is iWave part of the Line of Business IWS?
  - First of all, we would like to clarify that all iWave devices (190-500A) are high-end power sources!
  - All iWave products are supported by the product management of the LOB IWS!
  - Internally, however, there are different allocations of the revenue per power class. iWave 190i-230i (earlier TT/MW 190-230i) are part of the LOB PWT turnover. On the other hand, the new power sources, iWave 300i-500i, are assigned to LOB IWS.

- Which are the most relevant target groups / -segments for iWave 300i-500i?
  - All industrial customers, who want to solve recurring welding tasks in highest quality and thus produce perfect weld seams on different materials. Due to the universal applicability of iWave devices, the target sectors range from small to large enterprises. The following target segments / sectors deserve to be highlighted in particular:



- What are the highlights of the new generation?
  - The following points have been defined as the biggest highlights of iWave 300i-500i:
    - Targeted heat input [CycleTIG]
    - Self-explanatory operation | graphic-dynamic operation concept in more than 30 languages
    - Multiprocess PRO | 1 device for all processes
    - Reproducible ignitions | 71% lower ignition delay [RPI auto] *
      * *compared to RPI off | test series under laboratory conditions: 200A welding current / 0,5s welding time / 1000 ignitions!*
    - Industry 4.0 ready | contactless data transmission and authentication

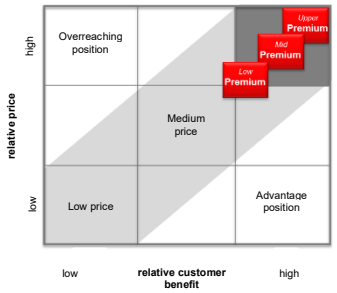
- Is this a new design or is iWave based on another device series?
  - iWave is based on the existing WeldOS platform, which is also used for TPS/i.

- When will manual TIG cold wire feeders be available?
  - The remaining system components (e.g. CWF, ...) for manual cold wire applications with iWave will be available around mid-2022.

- When will components for Robotics & automation be available?
  - Unfortunately, the development of system components for automated applications with iWave will take more time. According to the current project schedule, these products will be available around mid-2023.

- When will the successors of the existing plasma module and hotwire power source be launched?
  - Successors of the digital plasma module and the hot wire power source are definitely planned.
  - However, a new plasma module as well as a new hot wire power source will not be available until mid-2024.

- How are the products positioned in terms of price (pricing strategy)?



iWave power sources are positioned as high-end products in the premium price segment (upper premium). Our focus is on quality and performance-sensitive customers. By generating the highest possible customer benefit with our products, we can argue and enforce our premium prices. The exact prices are listed in the market launch concept and can be found in the price list 2022 as oft Start-of-Sales.

- Do the systems from 190A – 500A get the same firmware?
  - No, iWave 190i-230i have one firmware – iWave 300i-500i & TPS/i have a separate firmware.

1.1 Relaunch | iWave 190i-230i

- What's new? What changes compared to existing TT/MW 190-230i devices?
  - Software changes and a new product name are planned. No hardware adjustments will be made except for the additional iWave silk-screen printing on the side panel of the power source. The following changes will take place in January 2022:
    - New product name: MW 190 becomes iWave 190i AC/DC, MW 230i becomes iWave 230i AC/DC and TT 230i becomes iWave 230i DC.
    - Extended range of functions: With the Launch of iWave 300i-500i, new functions will be available that are also compatible with iWave 190i-230i. Newly available are e.g. OPT/i Documentation, OPT/i Limit Monitoring, OPT/i CycleTIG, RPI auto, ...
    - Starting with the relaunch in January 2022, iWave devices in the power class of 190A will be equipped with Wi-Fi, Bluetooth and NFC as standard and are therefore fully networkable.

- When will the relaunch take place?
  - The relaunch of TT/MW 190-230i will happen at the same time as the launch of iWave 300i-500i.

- Why a relaunch?
  - We want to simplify our portfolio and intend to clearly position all intelligent TIG High End power sources as one product family – under the product name „iWave". All devices are networkable as standard and have the same functional range!
  - Additionally, we create a clear distinction from TT 170/210 (DC Lean)!

- Does the relaunch have an impact on the prices of these power sources?
  - In the course of the relaunch in 2022, prices will be slightly adjusted. The following price changes will be realised:
    - iWave 190i AC/DC: 0% price increase
    - iWave 230i AC/DC: standard 1.5% price increase

    - iWave 230i DC: will be repositioned in terms of price (price reduction!)
  - Note: Nevertheless, please note the increased gross list price for iWave 190i-230i due to the new price group allocation! As of January 2022, these products will be assigned to price group 25 with 50% maximum discount (previously PG 18 with only 45% maximum discount), which leads to an increased gross list price but also to increased maximum discounts. Therefore, the subsidiary purchasing price etc. will remain the same.

- Will TT/MW 190-230i become robot / automation compatible through the relaunch?
  - No.

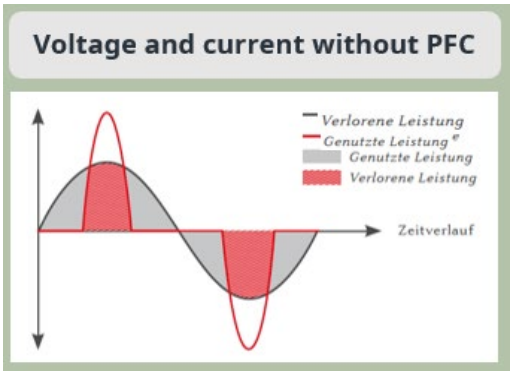
- Can I upgrade MW 190 to iWave 190i AC/DC?
  - No an upgrade of existing MW 190 devices is not possible.
  - An official statement concerning the networkability of iWave 190i units (unlike existing MW 190 power sources) is available on request from the product management.

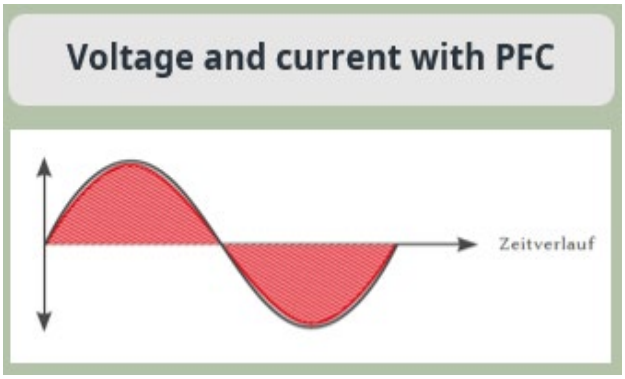
- Is the networkability option also available for MW 190?
  - No, this device is not networkable. Among others, this can be recognised by the missing “i” in the product name.
  - However, when purchasing an iWave 190i AC/DC power source (starting with 19th January 2022), the 190A power class units will also be equipped with connectivity (Wi-Fi, Bluetooth and NFC) as standard.

- Can I update an existing MW 230i to iWave 230i AC/DC?
  - No. This is not necessary, as the changes are limited to software and the new product name – so a usual firmware update is sufficient!

- Is iWave 190i AC/DC also available with water cooling?
  - No. iWave 190i AC/DC is still only available as gas cooled variant.

- Is the PFC function also available for iWave 190i-230i?
  - Yes, iWave 190i-230i also include the PFC function.





- Can the new function packages, e.g. CycleTIG, also be upgraded on existing MW/TT 230i devices?
  - Yes, the new function packages are also upgradable on “old” MW/TT 190-230i devices.
  - Prerequisite is firmware version V2.0.0 or higher.

1.2 Power source & options | iWave 300i-500i

- Which power source variants will be available?
  - The following power classes will be newly available: 300A / 400 A / 500A.
  - The following power classes are already available: 190A and 230A (prev. TT/MW 190-230i).
  - Each power class is available as DC or AC/DC variant (exception: 190A only AC/DC).

- Are there going to be MV variants? If so, in which voltage ranges do they operate?
  - Yes, each power class from 190-500A is also available as MV variant.
  - However, please note the different voltage ranges of MV variants of the single-phase and the 3-phase power source variants:
    - iWave 190i-230i MV: 120/230V
    - iWave 300i-500i MV: 200-600V → 1 power source for the entire voltage range from 200-600V!

- Which options are available with Start-of-Sales and which ones are there in general (soft- & hardware)?
  - Here you can find the option / function matrix iWave with all needed details:

Options / function matrix iWave

Category	Article number	Extension	iWave 190i AC/DC	iWave 230i DC	iWave 230i AC/DC	iWave 300i DC	iWave 400i DC	iWave 500i DC	iWave 300i AC/DC	iWave 400i AC/DC	iWave 500i AC/DC
WP	4,066,012	WP STANDARD				x	x	x	x	x	x
	4,066,013	WP PULSE				x	x	x	x	x	x
	4,066,014	WP LSC				x	x	x	x	x	x
	4,066,015	WP PMC				x	x	x	x	x	x
	4,066,016	WP CMT				x	x	x	x	x	x
OPT/i	4,067,002	OPT/i Jobs	x	x	x	x	x	x	x	x	x
	4,067,003	OPT/i Documentation	x	x	x	x	x	x	x	x	x
	4,067,004	OPT/i Limit Monitoring	x	x	x	x	x	x	x	x	x
	4,067,017	OPT/i Puls Pro	x	x	x	x	x	x	x	x	x
	4,067,028	OPT/i CycleTig	x	x	x	x	x	x	x	x	x
	4,067,007	OPT/i WebJobEdit	x	x	x	x	x	x	x	x	x
	4,067,009	OPT/i Synergic Lines				x	x	x	x	x	x
	4,067,012	OPT/i CMT Cycle Step				x	x	x	x	x	x
	4,067,013	OPT/i Custom NFC	x	x	x	x	x	x	x	x	x
	4,067,020	OPT/i Wire Sense				x	x	x	x	x	x
	4,067,023	OPT/i OPC-UA	x	x	x	x	x	x	x	x	x
	4,067,024	OPT/i MQTT	x	x	x	x	x	x	x	x	x
	4,067,005	OPT/i InterfaceDesigner Upload				x	x	x	x	x	x
	4,067,006	OPT/i GUN Trigger				x	x	x	x	x	x
HARDWARE OPTIONS	4,100,811, IK/CK	OPT/i TPS Staubfilter				x	x	x	x	x	x
	4,101,265, IK/CK	OPT/i TIG DC Multiprocess PRO				x	x	x			
	4,101,263, IK/CK	OPT/i TIG AC Multiprocess PRO							x	x	x
	4,101,276, IK/CK	OPT/i TIG PowerConnector AC							x	x	x
	4,101,277, IK/CK	OPT/i TIG PowerConnector DC				x	x	x			
	4,101,271, IK/CK	OPT/i TIG 2nd SpeedNet				x	x	x	x	x	x
	4,101,264, IK/CK	OPT/i TIG gas switch				x	x	x	x	x	x
	4,101,261, IK/CK	OPT/i TIG gas flow sensor				x	x	x	x	x	x
	4,101,259, IK/CK	OPT/i TIG gas controller				x	x	x	x	x	x
	4,101,260, IK/CK	OPT/i TIG 4 Switch SpeedNet				x	x	x	x	x	x
	4,101,262, IK/CK	OPT/i TIG Ext. Sensor				x	x	x	x	x	x
	4,101,266, IK/CK	OPT/i TIG 2nd NT242				x	x	x	x	x	x
	4,101,267, IK/CK	OPT/i TIG NT601				x	x	x	x	x	x
	4,101,063, IK/CK	OPT/i Ethernet iWave 190i/230i	x	x	x						
	4,101,124	I-kit carrying strap TST/MW/TT	x	x	x						

- Which options from the TPS/i can be used?
  - All software options of TPS/i (OPT/i and also WP) are also compatible with iWave and can therefore be used.
  - There are separate „TIG variants" for the hardware options, as adjustments had to be made due to issues such as HF resistance and internal design.

- What is the duty cycle?
  - 40% at 300/400/500A (at 40°C ambient temperature)

- Is there going to be a trial license?
  - Yes, the trial license can be activated for all power classes with an arc burning time of 10 hours.

- Are the new power sources generator-compatible?
  - Yes, all iWave power sources (190-500A) are generator-compatible.

- Is the software different between iWave and TPS/i?
  - No, this is a software bundle.

- Are SpeedNet and Ethernet optional or standardly included?
  - There are differences between single- and 3-phase iWave power sources.
  - The Ethernet port is still available as an option for single-phase units (iWave 190i-230i).
  - 3-phase power sources (iWave 300i-500i) are standardly equipped with SpeedNet and Ethernet.

- What is the maximum value for gas purging?
  - Gas purging will be possible up to 60 minutes.

- Can the gas purging process be interrupted?
  - Yes, the process can be interrupted directly at the user interface or by using the torch trigger.
- Can I use two gases?
  - Yes, the option OPT/i TIG gas switch is available, where it is possible to switch between two gases.
- Can the “cap shaping mode” also be deactivated?
  - Yes.
- Does the power source remember the last gas used after switching the device off and on again?
  - Yes.
- Why is a new CU 1200i being launched?
  - The CU 1200i is a cost-optimised cooling unit, which has been especially developed for our MV markets.
- Can the MIG/MAG wire feeder also be used for cold wire applications?
  - No, there will be a separate wire feeder variant for cold wire applications.
- Why are CU 1100i cooling units not compatible with MV iWave power sources?
  - Since the MV iWave variant can cover a voltage range of 200-600V, it is only compatible with 24V DC supplied cooling units.
- Can Bluetooth remote controls and Bluetooth helmets be connected at the same time?
  - Yes, a maximum of one remote control and any number of welding helmets can be connected to the power source at the same time.
- Can TIG-specific functions also be activated with our dongle?
  - Yes, the Fronius Dongle also activates all TIG specific software functions on iWave.
- Is the MCU identical to TPS/i?
  - Yes, the MCU is identical to the MCU of the TPS/i.
- Is job welding standardly possible with iWave?
  - Yes, job welding is standardly possible with all iWave power sources.
- Is there a difference between the job logic of iWave compared to TPS/i?
  - No, there is no difference.
  - The same job logic from TPS/i applies to all iWave power sources.
  - Attention: This corresponds to a change in the former job logic of previous TT/MW 190-230i devices! Job welding is now standardly possible with iWave 190i-230i from firmware version V2.0.0 (just as with iWave 300i-500i and TPS/i), which means an extension of the standard range of functions of these power sources. The software package “4,067,002 OPT/i Jobs“ activates the additional functions described below.

Power sources	Standard scope of functions	Additional scope of functions with 4,067,002 OPT/i Jobs
iWave & TPS/i 	○ Create up to 1000 Jobs ○ Display Jobs ○ Compare Jobs ○ PDF export function	○ Edit, import and export Jobs via SmartManager ○ CSV export function

- Why are iWave power sources heavier and bigger than previous TT/MW devices?
  - This is mainly caused by the technical design of the units (MIG/MAG + AC inverter) and the increased duty cycle value*. Since the decision was made to build up on the existing unit concept of the TPS/i with iWave, the basic weight of the TPS/i was already specified. In addition, there is the weight of the AC inverter, which alone is around 18kg (e.g. 300A).

    *Duty cycle | MW 3000: 100% at 190A vs. duty cycle | iWave 300i AC/DC: 100% at 240A

1.3 Multiprocess PRO | iWave 300i-500i

- What does „Multiprocess PRO“ mean when it comes to iWave?
  - Multiprocess PRO → 1 power source for all welding processes!
  - Multiprocess PRO stands for a fully comprehensive TIG power source, which is expandable with TPS/i hardware and software packages.
  - iWave 300i-500i are the only Fronius power sources, which combine all welding processes in one single device and can therefore be used without any restrictions for TIG DC or AC/DC (incl. HF), MMA, CEL and MIG/MAG welding. All available processes or Welding Packages can be used with iWave – upgrading to WP CMT is possible!

- Can all iWave power sources be used for all welding processes?
  - All 3-phase iWave power source, namely iWave 300i-500i, are Multiprocess PRO devices (DC as well as AC/DC) and can therefore be used for all welding processes.
  - This does not apply to single-phase power sources, iWave 190i-230i!

- Which components / options are necessary for MIG/MAG welding with iWave?
  - To be able to weld MIG/MAG with iWave, the following components are required:

    iWave system (base)
    + OPT/i Multiprocess PRO
    + MIG/MAG hardware (z.B. wire feeder, welding torch, ...)
    + MIG/MAG welding package
    + optional software packages

- Can existing TPS/i components (TPS/I wire feeder, torches, ...) be used?
  - Yes, all peripheral TPS/i system components are compatible with iWave. Existing TPS/i system components can be used for MIG/MAG applications with iWave.

- Will arc gouging be possible with iWave?
  - Yes, but only with iWave 500i.

- Will iWave cannibalise the TPS/i?
  - No! There is not danger of iWave cannibalising the existing TPS/i series. iWave is and remains a TIG power source, which can be additionally used for MMA and MIG/MAG welding. If you compare iWave with TPS/i, you will notice that there are different connections. The iWave power source must first be upgraded with the option “Multiprocess PRO”, the corresponding MIG/MAG components and welding packages before it can be used for MIG/MAG welding. A customer who mainly welds MIG/MAG applications will therefore not automatically choose an iWave power source. Especially because of the price differences between the two systems. *A detailed price comparison can be found in the Strategy Paper iWave.*

- What are the arguments in favour of Multiprocess PRO and against separate TPS/i and iWave 190i or 230i systems? In terms of price, two separate systems (depending on the power class and variant) may be more attractive... In addition, with two separate power sources, you can employ two welders in production and not just one.
    - Attention: These are two completely different requirements and target groups.
    - Based on his requirements and the respective application, a customer decides in advance whether he prefers / needs an all-in-one system or two separate systems in his production environment.
    - The decisive factor is the type of application and the required TIG power range (either below 230A or above 300A). If more than 230A are required, iWave 300i-500i must be used anyway!
        - Detailed example - see next question!
    - The price differences of a Multiprocess PRO system compared to a TPS/i & TIG01 system vary depending on the power class and power source variant, but in most cases they are quite small!
    - The price difference is particularly decisive in the upper TIG power range. If, for example, TT 4000 and TPS 400i are required, an iWave 400i Multiprocess PRO system offers a clear price advantage!

- For which applications is a Multiprocess PRO system particularly suitable and when are two separate systems (TPS/i and iWave) better?
    - For some applications, the TIG welding process is used first and then the MIG/MAG welding process is used on the same component (e.g. root with TIG and filler layers with MIG/MAG). Here a Multiprocess PRO system is particularly suitable or advantageous, as both steps are carried out by the same welder / at the same workplace and on the same component. With iWave Multiprocess PRO, the user saves a lot of time and effort, as the one device covers all welding processes and the process change is done with only one push of a button (without refitting).
    - Additional advantages for this use case:
        - reduced demand for space (2-in-1), resource-saving and reduced energy consumption!
        - In the broadest sense: Only 1 power source that covers all requirements. Accordingly, only 1 power source, which has to be manufactured, packed, transported to the customer or place of use, equipped with further system components, supplied with energy and gas, regularly maintained and disposed of (recycled) at the end of its service life. This does not only save resources, but also running costs!
    - For other applications, however, two separate systems might provide more advantages because two different welders can work simultaneously (e.g. on different components).
    - Depending on the customer's requirements, it has to be decided which system is more suitable!

- *From a dealer's point of view:* Do I have to sell a multi-process PRO system if a TPS/i and a separate iWave 190i-230i system would be more attractive in terms of price?
    - No, the system that meets the customer's requirements best should be preferred.
    - This decision must be made together by the consultant and the end customer.

- How does the multi-process scope of iWave differ from the TransSteel series, for example?
  - iWave 300i-500i can be upgraded with all TPS/i welding processes (up to WP CMT). This was not possible with previous multi-process units. In addition, these power sources have full TIG process capability incl. high-frequency ignition.
  - All available WPs and options of the TPS/i series are compatible with iWave.
  - This is not the case with existing multi-process units (e.g. TransSteel).

- Can TIG and MIG/MAG welding torches be connected at the same time?
  - Yes, both welding torches can be connected at the same time.

- How does the process change take place?
  - The process change can be easily carried out via the touch screen of the user interface or the torch trigger.
  - In addition, a process change can also be triggered via a JOB change.

- Can I convert a TPS/i power source to a iWave power source?
  - No, this is not possible.

- Is it possible to use the foot remote control for MIG/MAG welding in combination with the Multiprocess PRO variant?
  - No, the TIG foot remote control has no function for MIG/MAG processes.

- Can the HF ignition also be used for MIG/MAG welding?
  - No, this is not planned at the moment.

- Will there also be a dual feeder option for iWave 300i-500i?
  - Yes, it will also be possible to use a MIG/MAG and a TIG wire feeder in the future.

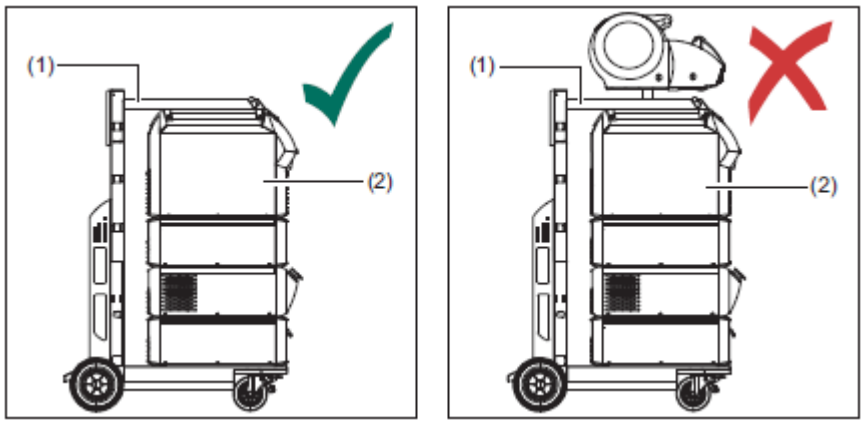
- Is a Multiprocess PRO system also suitable for PushPull?
  - Yes, a Multiprocess PRO system can also be equipped with MIG/MAG PushPull.

- Does iWave have exactly the same MIG/MAG characteristics (welding properties) as TPS/i?
  - Yes, the same Welding Packages and characteristics are used as already known from the TPS/i.

- In case of a Multiprocess PRO system, can I connect both torches to the power source at the same time?
  - Yes. However, when using a MIG/MAG and TIG torch on one system, the maximum torch hose pack length of 14m must not be exceeded.
    ATTENTION: If a PullMIG torch is used, the maximum torch hose pack length is 10m. Any length above 10m might result in a too low flow rate and error messages.

1.4 Periphery | cooling unit, transport unit, …

- **Cooling unit**
- Which cooling units will work?
  - All existing CUs, including the new CU 1200.

- 

  - *Note: Due to the total height, a cold wire system cannot be used in combination with an AC/DC iWave and CU2000.*

- Will existing cooling units work with iWave power sources?
  - Yes.
  - *ATTENTION: Due to the larger mains voltage range of the MV devices (200-600V), ONLY 24V supplied cooling units can be used.*

- What is the maximum hose pack length?
  - The maximum possible lengths is 12m for TIG hose packs, otherwise the high-frequency ignition might be impaired.

- What does the cooling unit run on?
  - The Fronius cooling unit is operated with a special coolant (FCL 10 or FCL 20).

- Can I mix the FCL (Fronius Cooling Liquid) with water?
  - No.

- What happens if you use normal water instead of FCL for cooling?
  - Full corrosion protection is no longer given and a full heat dissipation can no longer be guaranteed.

- Is the cooling unit equipped with a level sensor as standard?
  - The level sensor is included as standard in the MC (Multi-Control) cooling units. In all other cooling units it can be added as an option.

Remote control

- Which remote controls will be available or usable?
  - RC Bar 1P
  - RC Bar iJob
  - RC Panel MMA
  - RC Panel BASIC/TMC - BT
  - RC Pedal TIG/TMC – BT
  - RC Panel TIG/TMC – BT

- Can the TMC cable also be extended?
  - Yes, an extension cable is available for this purpose. ***OPT/i TMC Cable EXT/5m 43,0004,5979***

- Can existing remote controls be used with the new power sources?
  - Yes.

- What can be set / changed with the wireless remote control?
  - Main current and I2.

- Does the foot remote control require manual configuration or does it connect automatically to the power source?
    - The foot remote control must be selected at the user interface when it is connected to the power source for the first time and then it is automatically paired (pairing process as known from consumer electronics). First connection requires pairing and afterwards ON/OFF (similar to Bluetooth headphones).

- How long does the battery of the wireless remote control last?
    - The remote control is extremely energy-efficient and only needs to be recharged after approx. 1 ½ years in 2-shift operation, for example.

- How many Bluetooth remote controls / Vizor Connect helmets can be connected?
    - Only one RC panel or RC pedal can be used at the same time, regardless of whether the remote control is connected via Bluetooth or TMC connector. BUT you can connect as many Vizor Connect helmets as desired.
        - Vizor Connect helmets → no limit!
        - Bluetooth remote control → one!

- **TIG cold wire**
- Do all iWave variants work for TIG cold wire applications?
    - All, except iWave 190i-230i.

- **Transport units**
- Which transport units will be available?

	TU Car 2 Easy	TU Car 2 Basic	TU Car 4 Basic	TU Car 4 Standard	TU Car 4 Pro	TU Podium	TU lifting facility TPS/i	TU wall mount
iWave 190i-230i	●	●	●	●	●			
iWave 300i-500i		●	●	●	●	●	●	●

    - All transport units, which can already be used with TPS/i.

- Is the housing size of iWave and TPS/I identical?
    - iWave DC have the same housing as the TPS/i devices.
    - iWave AC/DC power sources as already known from TPS/i LSC Advanced.

- What about the internal communication speed?
    - SpeedNet → 100 MB/s.

- What is the longest power cable that can be used with iWave?
    - That depends on the used power cable. However, it is important that the voltage loss in the cable is within the machine's mains voltage tolerances so that the maximum output power can be maintained.
    - The longer the power cable, the thicker it has to be.

1.5 TIG welding torches

- Which welding torches are used for iWave?
  - The existing THP/i and THP small handle are used.

- I-torches / d-torches / … which torch variants work on which power sources?
  - An overview can be found in this file: https://collaboration.fronius.com/pw/products/productsandservices/tor/Documents/Torches%20and%20PowerSources%20TIG.xlsx?d=wf67f6cc30a72483aa9257c242543df6b

- Why does the Jobmaster display switch off at the welding start?
  - The display switches off when welding starts and is reactivated after welding or by simply touching the handle, in order to protect the display and to increase its service life.

- Can gas-cooled torch bodies be used on water-cooled hose packs?
  - The use of gas-cooled torch bodies on water-cooled hose packs is not intended. Damage on the welding torch may occur.

- Can the old torch generation TTG/TTW be used on iWave?
  - The old TIG torch generation will be discontinued on 01st January 2023.
  - Existing welding torches can be used on iWave (except Jobmaster variants!). An adapter is required for this purpose.

- Can an existing UpDown torch be converted to Jobmaster?
  - Yes, the user interface can be easily changed. All you have to do is loosen one screw. The UpDown user interface can then be removed and the Jobmaster user interface can be inserted. Article number of user interface “Jobmaster”: 44,0350,5409,U

- Is Jobmaster usable on d-torches?
  - Unfortunately, this is not possible.
  - Jobmaster can only be used in combination with i-torches.

- Are small handle torches also available with Jobmaster?
  - No, small handle torches are not available with Jobmaster function due to limited space.

- Which advantages do champagne gas nozzles provide?
  - Champagne gas nozzles are equipped with a sieve and provide a broad gas coverage. Champagne gas nozzles are used for all materials, especially for high-alloy steels, titanium and NiBas. This results in almost no tempering colours and reduced re-work. In addition, accessibility is improved because the tungsten electrode can be clamped more to the outside.

- For which torch body variants are champagne gas nozzles available?
  - For TTB 160P / TTB 300P and for TTB 220P / TTB 400P.
  - Champagne gas nozzles are not available for the plug-in version (A).

- Are champagne gas nozzles also available as glass version?
  - Yes, we will also include the glass variants in our portfolio. However, this is only suitable for DC up to approximately 170A (this is an estimated value – exact limit tbd).

- Are there any tests or guidelines which gas nozzle diameter or gas lenses should be used with how many litres per minute?

- There are tests and guide values for the champagne gas nozzles, with the small champagne gas nozzle the flow rate should be between 13 - 15 l / min and with the large champagne gas nozzle between 15 - 17 l / min.
- According to DVS there are guide values, see table below. The DVS leaflet 0934 also gives a very rough overview. However, the table should be understood with caution because the flow rate changes with the application, gas lense, electrode diameter, free electrode end and shielding gas composition. Basically, it can be said that the flow rate is approx. 6 - 10 l / min.

WIG-Schutzgasdüsen (nach DVS)

Schutzgasmengen in Abhängigkeit von der Schutzgasdüse			
Düsen-größe	**Durchmesser mm**	**Düsenquerschnitt mm^2**	**Durchflussmenge l/min**
4	6,35	32	2,1 bis 2,5
5	7,94	49	3,3 bis 3,9
6	9,53	71	4,7 bis 5,6
7	11,11	97	6,4 bis 7,6
8	12,70	127	8,4 bis 9,9
9	14,29	160	10,6 bis 12,5
10	15,88	198	13,1 bis 15,4

1.6 Digitisation & data documentation | iWave 190i-500i

- Will iWave be compatible with WeldCube?
  - Yes, the known functionality from TPS/i will also be given with iWave.
- What possibilities are there for data documentation?
  - WeldCube Light, Basic and Premium.
    - Decentralised data documentation: WeldCube Light or Basic
    - Centralised data documentation: WeldCube Premium.
- Will it be possible to log in with an NFC card?
  - Yes, Customer NFC is also possible with iWave. ***OPT/i Customer NFC 4,067,013***
- User Management: Can the roles & rights (user management) be transferred e.g. from TPS 320i to iWave power sources?
  - Yes, this is possible.
- Are all iWave power sources Bluetooth and Wi-Fi capable?
  - Yes, starting with January 2022 all iWave power sources will include Bluetooth, NFC and Wi-Fi as standard (NEW: also iWave 190i AC/DC).
- Is a calibration document included in the scope of delivery?
  - Yes.
- Can average values be exported via PDF, e.g. for procedure welding?
  - Yes.

1.7 Processes & welding properties

All details concerning CycleTIG and RPI auto can be found in the corresponding presentation and also in the USP list for iWave!

- Which process-relevant functions will be available with iWave?

Options / function matrix iWave											
Category	Article number	Extension	iWave 190i AC/DC	iWave 230i DC	iWave 230i AC/DC	iWave 300i DC	iWave 400i DC	iWave 500i DC	iWave 300i AC/DC	iWave 400i AC/DC	iWave 500i AC/DC
WP	4,066,012	WP STANDARD				x	x	x	x	x	x
	4,066,013	WP PULSE				x	x	x	x	x	x
	4,066,014	WP LSC				x	x	x	x	x	x
	4,066,015	WP PMC				x	x	x	x	x	x
	4,066,016	WP CMT				x	x	x	x	x	x
	4,067,017	OPT/i Puls Pro	x	x	x	x	x	x	x	x	x
	4,067,028	OPT/i CycleTig	x	x	x	x	x	x	x	x	x

- When exactly will the new functions / options be available?
  - All mentioned functions will be available with the Start-of-Sales of the iWave device series.

- Will simultaneous TIG welding on both sides (synchronized TIG welding) be possible?
  - Yes.

- Can the slope time for the I2 current be adjusted separately?
  - Yes, it can be set separately (up and down slope maximum value 250% of main current).

- Will special 4-step variants be available?
  - Yes, all special 4-step variants known from the digital generation (TT/MW) are available.

- What is the maximum hose pack length?
  - Maximum hose pack length is 12m, as longer hose packs can impair the high-frequency ignition.

- Does the R/L alignment influence the HF ignition?
  - No, as noted in the standards the HF must be measured directly at the sockets of the power source. However, the R/L adjustment is very important so that the correct voltage is displayed on the power source, but also for polarity reversal during AC welding.

- Is the U-Help voltage only integrated in AC/DC units or also in DC power sources?
  - It is only installed in AC/DC power sources because the Help is connected to the alternative current inverter.

- Can CEL electrodes also be welded with iWave?
  - Yes.

- Is there now also a second option for setting the size of the cap diameter or is it set via the electrode diameter?
  - This is always set via the electrode diameter in the first menu level.

CycleTIG

- In which current phase of CycleTIG does the tacking parameter work?
  - The tacking function is only active during the “interval time”. If a basic current of 3A is set and a main current of 100A, the tacking function (TAC) is only active for the 100A.
  - However, it is possible to set the basic current higher than the main current, in which case the exact opposite is achieved and the tacking function is only active in the low-current phase.
  - The tacking function (TAC) must be set to “on” if you want to use the setting as mentioned above.

- Does the ignition always start on the positive pole with CycleTIG?
  - Yes, with CycleTIG you always start with an ignition at the positive pole.
  - The subsequent ignition is always attempted at the negative pole first.
  - If an ignition does not succeed at the negative pole, for example, the polarity is automatically reversed to positive and vice versa. The polarity is reversed until the arc ignites (always alternating at the positive and negative pole).

- What is the difference between CycleTIG and Pulse?
  - CycleTIG is fundamentally based on interval welding or pulse welding, which simplifies and facilitates TIG welding through different parameter combinations.
  - CycleTIG can be combined with the Pulse and Tacking function: In combination with the Tacking function, an excellent seam optic can be generated. In combination with the Pulse function, additional pulsing can be set in the low- and high-current phases.
  - CycleTIG allows pulse parameters to be set in absolute values (milliseconds vs. %).
  - The base current can also be switched off. This is not possible with conventional pulsing.
  - CycleTIG already starts in the start current phase and ends with the end of the end current phase. Conventional pulsing only starts with the up-slope and ends with the end of the down-slope.
  - The cycles can be freely set and thus the weld and break time can be exactly defined and adhered to.

- If CycleTIG, Pulse and Tacking are activated at the same time, which function is taken over?
  - In this case CycleTIG and Tacking (TAC) are taken over.

- Is CycleTIG only set in rectangular wave form? Or will it also be adjustable?
  - The change between pulse- and base-current is sudden, means as fast as possible. If the OPT / i Pulse Pro is activated, the wave form can be set at the double pulse.

- Is CycleTIG a payable activation?
  - Yes, CycleTIG is a charged software option. *(OPT/i CycleTig 4,067,028)*

- Will there be a parameter list, so you can immediately find the right parameters for CycleTIG?
  - Yes, these parameters can be found in the CycleTIG presentation under “application examples”.

RPI auto

- Does RPI auto work with all iWave power sources?
  - RPI auto is only available for AC/DC power sources.

- Are there any restrictions regarding RPI auto with iWave 230i?
  - No, there are no restrictions. RPI auto works with all iWave AC/DC power sources in the performance classes 190-500A.

kHz pulsing

- Is there a difference between DC and AC for kHz pulsing?
  - No.

- Why is kHz pulsing only possible up to 10 kHz with Fronius power sources?
  - An official document on this topic can be found on our SharePoint product site.
  - In September 2021, there was an official paper entitled “Practical consideration of a high-frequency pulsed TIG arc” at the DVS Congress. The entire document can be found on the above linked product page.

Summary and conclusion: "From the literature ... it can be seen that high-frequency pulsing in the kHz range causes additional constriction or focussing of the arc. In practice, however, the physical limits of high-frequency pulsing are quickly reached due to the sometimes high inductances in the welding circuit (> 10 µH) ... All the results of the practical tests carried out have shown that when the high-frequency pulsed process is compared correctly with a constant-current process, there are no advantages in terms of weld seam quality, arc focusing and penetration. In order to keep the inductance low, it is necessary to pay close attention to the correct cable placement and short cable lengths for high-frequency pulsed welding systems, which, however, is usually not possible in terms of application technology. Another disadvantage of this process is the high noise level caused by the high-frequency pulsed arc. The expected advantages of the high-frequency pulsed TIG arc were not proven in the practical tests".

General questions about TIG functions

a) Tacking function

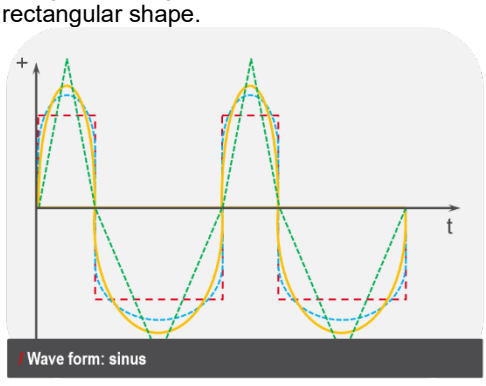
- Why can't the tacking function be used when switching to alternating current?
  - Alternating current is used for welding aluminium and magnesium. The main problem is that the aluminium oxide layer has a much higher melting point compared to the base metal. Another problem is that the thermal conductivity of aluminium is very high. In short, a high welding current has a better behaviour to generate fast tacking points than a pulse overlaid alternating current. If an alternating current is overlaid with pulses, a very high current would be required to obtain the same effective current. This leads to very fast vaporisation of the base material and an uncontrollable melt pool. We are continuing to look at improving and simplifying tacking on aluminium, but to date tests with a pulse overlaid alternating current have not shown any advantages.

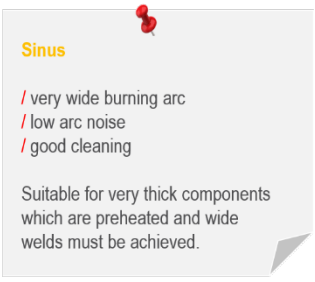
b) General explanation of AC waveforms

- Which is the standard waveform of the new generation?
  - Standard wave form of iWave is square soft (like TT/MW).

Sinus

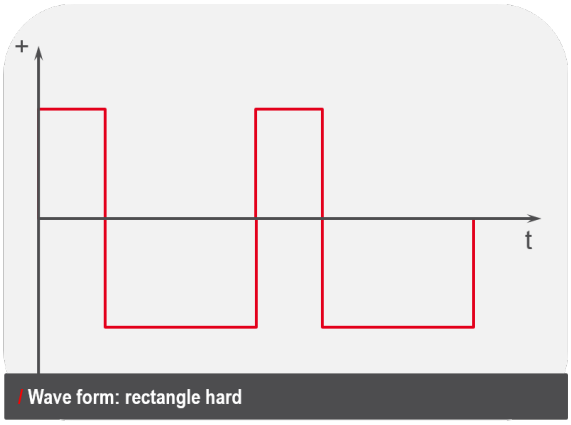
Very smooth and quiet arc noise. The arc burns slightly wider than with a rectangular half-wave. This curve shape is suitable for very thick components which are preheated to achieve wide weld seams, but also to reduce the arc noise at high amperages. The "sinus" half-wave setting produces a wide burning arc, which is unstable compared to the rectangular shape.





Rectangle hard

Very stable arc, but very loud arc noise. This half-wave was originally developed to achieve a very fast zero crossing without the arc breaking off. Many welders are still used to this setting.



/ Wave form: rectangle hard

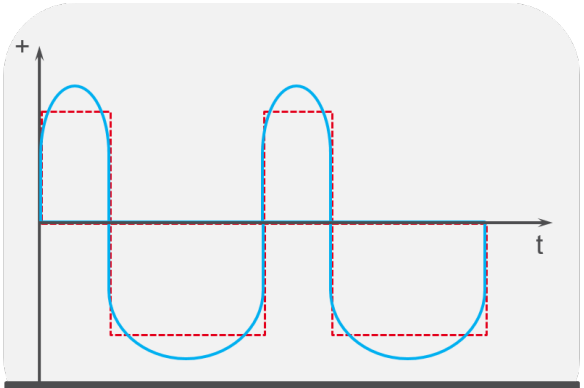
Rectangle Hard

/ very good arc stability
/ loud arc noise
/ very good cleaning

Suitable for heavily coated oxide layer (e.g., AlMg alloys), e.g. repair work on cast aluminium

Rectangle soft

This waveform is a further development of the "rectangle hard" waveform with the advantage that the arc noise is quieter. The "rectangular soft" curve combines the advantage of the "sinus" curve (which is "quiet") with the advantage of the "rectangular hard" curve (which has a stable arc). "Rectangle soft" is also considered as universal setting.



/ Wave form: rectangle soft

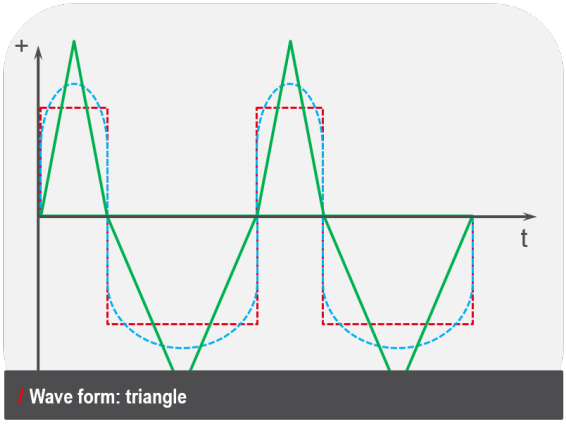
Rectangle soft

/ very good arc stability
/ quiet arc noise
/ very good cleaning

Suitable for most aluminum applications because the arc burns stably and the arc noise is reduced compared to the rectangle hard.

Triangle

The "triangle" half-wave reaches a higher peak current than all other half-waves. This increases the arc pressure and helps to achieve a reliable penetration for root passes. The direct average current is the same as all other half-waves. The arc noise is only slightly louder than with the "sinus" setting.



Triangle

/ very good arc stability
/ good arc noise
/ highest arc pressure:

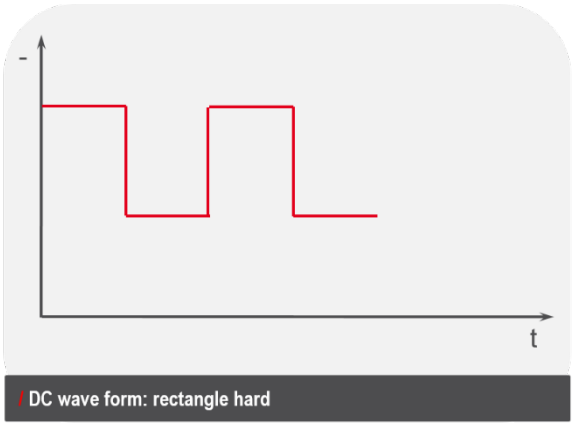
Arc pressure increases with the current and using Triangle achieves the highest current peaks.

Suitable for root welding (for example V seam), T joints (fillet welds, heavy wall Aluminium

c) General explanation of DC waveforms

Rectangle hard

This curve shape is mainly used for butt welds on pipe joints without filler material up to a material thickness of approx. 3 mm. The fast switching and the "hard" current corners give the arc a "harsher" tone.
The fast switching causes a fast cooldown and also heat-up of the weld pool. This prevents the molten bath from flowing and still achieves a good penetration.

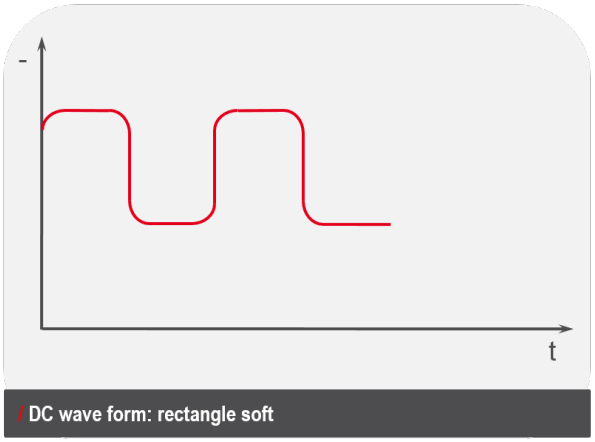


Rectangle hard

/ „hard“ pulse arc
/ For butt welds on CrNi steel up to 3mm (orbital welding)
/ Butt joint applications

Rectangle soft

With this waveform, the current corners are rounded (a rope is deposited). This results in a gentle arc noise and is used in practice as a universal setting for fillet welds, filler and final layers.

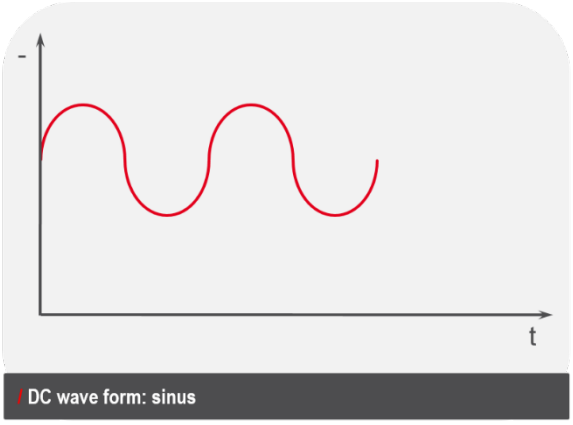


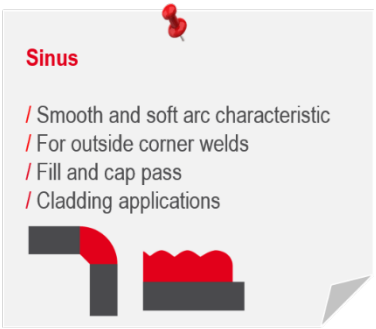
Rectangle soft

/ Factory setting
/ Rounded current rise (tau)
/ Universal usage, e.g. fillet welds
/ Equal to the digital series (MW/TT 1700 -5000)
/ Less arc noise compared to rectangle hard

Sinus

The Sinus pulse wave setting generates a higher heat input than the rectangular hard and rectangular soft waveforms. The weld pool cools down very slowly and also heats up again slowly. This ensures a good flow of the weld pool. This setting is mainly used for corner joints and deposition welding.





1.8 Services

- How long do I have warranty as a customer?
  - Standard warranty is 2 years.
  - Warranty extension (up to 5 years) can be purchased for all power source variants.
  - For iWave 190i-230i there is also the possibility of a free warranty extension to 3 years with online product registration.

- Can I register all iWave devices online (free warranty extension to 3 years)?
  - No, only iWave 190i-230i (PWT) can be registered online.
  - Online registration and free warranty extension to 3 years is not possible for the new, 3-phase iWave power sources (IWS).

1.9 OTHERS

- Where can I find the error-list with descriptions for iWave?
  - The already known error database of the TPS/I can be used for this purpose.
  - The same error handling applies to iWave as for TPS/i.

iWave Cold- & DynamicWire

- Can I use the CWF 25i (TIG cold wire feeder) with all iWave power sources?
  - iWave 300i-500i are compatible with CWF 25i and can therefore be upgraded to TIG cold wire systems at any time. iWave 190i-230i are not compatible!

- What is the difference between TIG DynamicWire and conventional cold wire welding?
  - The conventional cold wire welding process feeds the wire constantly without any regulation. Wire feed and current have to be set individually. An adjustment of the wire feed to the welding current must be carried out manually.
  - DynamicWire uses the wire feed as active control parameter. Current and wire feed don´t have to be set individually anymore – a characteristic (like for MIG/MAG) is chosen. The wire feed thus adjusts to the arc length, to the wire feeding angle and to the weld shape. In this way, tolerances can easier be levelled out and the wire feeder doesn´t push forward during torch changes.

- Does the wire feed change with DynamicWire?
  - Yes, the average wire feed depends on the arc length, the welding speed, the torch angle and the weld shape. The average wire feed typically varies from +/- 0,5 m/min.

- What happens if the wire doesn´t touch the weld pool?
  - If the wire doesn´t touch the weld pool but the base material, a short circuit is measured and the wire feeding stops. The setting of the wire feed and arc length are very important parameters! Just as with conventional TIG welding you must also stay in the parameter window.

- How does the dynamic wire feeder motor affect the average wire feed speed?
  - The average wire feed depends on the arc length, the welding speed, the torch angle and the weld shape. The average wire feed typically varies from +/- 0,5 m/min.
  - In contrast to the previous model the dynamic wire feeder has an oscillation, but the average wire feed speed is constant in a range of 10 ms.

- Does the tacking function work with DynamicWire?
  - Yes, but only after the second weld as the resistance of the earth cable must be determined first.

- Can you combine pulse with DynamicWire?
  - Yes, DynamicWire can also be combined with a standard pulse.

- Can I combine DynamicWire and CycleTIG?
  No, because with CycleTIG there is a risk that the wire will get "stuck".

- Why do I have to make a R/L alignment when using DynamicWire?
  - For DynamicWire a current measuring on the wire is needed. The first potential is detected on the wire itself, the second potential is detected via the earth cable. As current flows through the earth cable a voltage drop occurs. This means that the voltage during a short circuit is not 0 but that there is (depending on welding power and resistance of the earth cable) a value of 1.5V. With the R/L alignment the measured voltage can be levelled out.

- Do I have to choose a special characteristic for example for CrNi 19.9?
  - No, as there are higher-level characteristics for DynamicWire! For example, CrNi Steel contains CrNi19.9, CrNi18.8,…

- Which inner liner do I have to use for aluminium wires?
  - For aluminium wires you have to use a separate inner liner with a consistent wire feed hose.

- Why is the inner liner equipped without a protective hose?
  - To make the inner liner as flexible as possible, it is not equipped with a protective hose.

- Which distance do I have to set between tungsten electrode and wire?
  - This differs according to the power range. The distance should always be between 1-4mm.

- Can I use old cold wire torches with the new iWave system?
  - No!

- Will there also be torches with internal wire installation?
  - No!

- Why am I limited to 320A maximum power with DynamicWire?
  - As we are limited to an electrode diameter of 3.2mm with our TFC torch system, characteristics with higher current are not applicable at the moment.

- What is wrong when the wire feeder is feeding constantly despite DynamicWire?
  - A R/L alignment must be conducted to ensure a correct voltage measurement.

- Why does the wire autonomously stop in front of the arc?
  - Please conduct a R/L alignment to ensure a correct voltage measurement.

- Where does the cold wire feeder have to be connected?
  - The cold wire feeder must always be connected at the front SpeedNet-interface of the power source the voltage measurement is available here.

- Can I use the CWF 25i also for MIG/MAG welding?
  - No! The housing components of the CWF25i and WF25i are identical but the internal components totally differ.

- Is there a front panel for the new cold wire feeder (CWF 25i)?
  - No, the parameterization always happens on the power source.

- Can I also connect the torch to CWF 25i?
  - Yes, for this purpose we have the option OPT/i CWF TMC. With its help, a connection hose pack can be plugged in and thus the torch can be directly connected to the CWF 25i.

- Can a MIG/MAG and a TIG cold wire feeder be combined with an iWave?
  - Yes, also this kind of double head (WF 25i and CWF 25i) can be configured.

- What do I need for DynamicWire welding?
  - For DynamicWire welding you need a standard TIG cold wire system as well as the Welding Package „4,066,018 WP TIG DynamicWire".

- Is DynamicWire activated with the Trial License?
  - Yes, TIG DynamicWire is also activated with the Trial License starting with Firmware V 3.2.30.

- On which torch types can the cold wire feeding be mounted?
  - The new cold wire feeding can be mounted on the new TFC torch bodies.

- Can I start and stop the wire feeder manually as well?
  - Yes, for this purpose we have a separate parameter with which the wire can be started or stopped via the LED-button.