

# Panasonic



WG3-Serija  
WG3 Series

experts in productivity

Panasonic



## Robotski sistemi za zavarivanje The Arc Welding Robot System

Robot i kontroler su integrисани sa izvorom struje i servo motorom dodavača žice u jednu jedinicu. Brži, bolji i na svetu jedinstveni. Sve na jednom mestu se isplati.

Robot and controller fused with welding power source and servo wire feeder to one unit. Faster, better and worldwide unique. All from one that pays off.



**Panasonic težnja,**  
„Sve u jednom“.  
Vaša dobit Nema  
problema sa interface-om

**Panasonic pursues**  
“Only one” in welding.  
Your benefit: No  
Interface problems



WG3  
350A, 80% ED / DC  
(pulse 60% ED / DC)

WGH3  
450A, 100% ED / DC  
(standard / pulse)

TAWERS 100 kHz napredna inverterska tehnologija

- Zavarivanje bez ili sa malo pucne
- Zavarivanje sa manje unosa temperature
- Zavarivanje tankih i debelih materijala sa jednim sistemom
- Eliminacija / smanjenje prepravki
- Velika fleksibilnost u procesu zavarivanja
- Sniženje proizvodnih troškova
- Poboljšan kvalitet i produktivnost

TAWERS 100 kHz advanced inverter technology

- Low spatter welding
- Welding with less heat input
- Thin and thick plate welding with one system
- Rework elimination / reduction
- High flexibility in weld process
- Reduce production costs
- Improve quality and productivity

experts in productivity

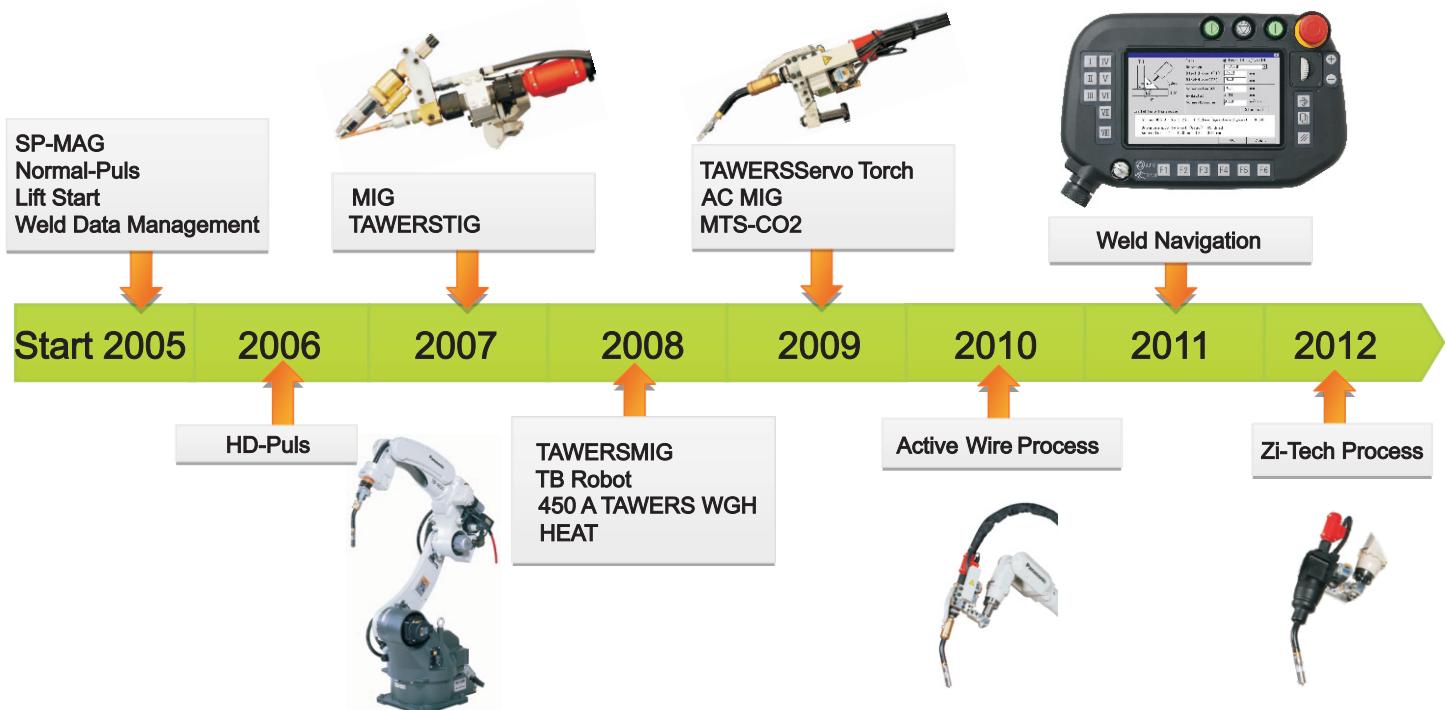
Panasonic



Nudi sve navedene procese zavarivanja  
Offers all these welding processes

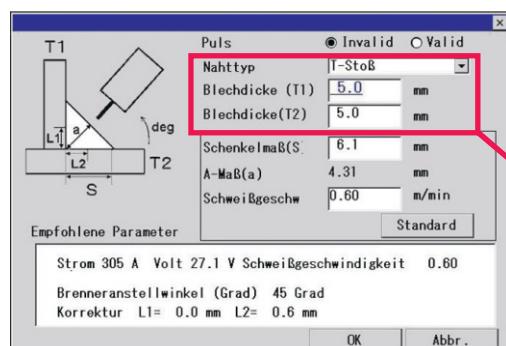
SP-MAG, HYPER DIP PULS, ACTIVE WIRE PROZESS, MAG-HEAT,  
MTS-CO2, MIG SYNCHRON PULS, PULL AC-MIG i TIG (DC)

SP-MAG, HYPER DIP PULSE, ACTIVE WIRE PROCESS, MAG-HEAT,  
MTS-CO2, MIG SYNCHRONOUS PULSE, PULL AC-MIG and TIG (DC)



## TAWERS™ The Arc Welding Robot System

### Upravljanje lukom zavarivanja Navigation for Arc Welding



Jednostavno pronalaženje optimalnih parametara zavarivanja:

1. Izbor debljine materijala T1 + T2 i tipa spoja
2. To je sve. Dobićete preporučene parametre.

Easy way to find your welding parameters:

1. Selection of material thickness T1 + T2 as well as joint type.
2. That's all. You have your recommended parameter.

**experts in productivity**

# TAWERS™ The Arc Welding Robot System

## Fleksibilnost - Sve u jednom Flexibility - One for all

TAWERS nudi mogućnost zavarivanja u MIG, MAG ili DC-TIG postupcima.

Prebacivanje sa MAG na MIG ili TIG je jednostavno. Zahteva samo MIG/TIG osnovni paket, tečno hlađen gorionik i MIG / TIG Software.

TAWERS offers the opportunity to do MIG, MAG or DC-TIC welding.

A modification from MAG to MIG or TIG can be done easily. It requires only the MIG / TIG base package, the watercooled torch and the MIG / TIG Software.



## TAWERS™ The Arc Welding Robot System

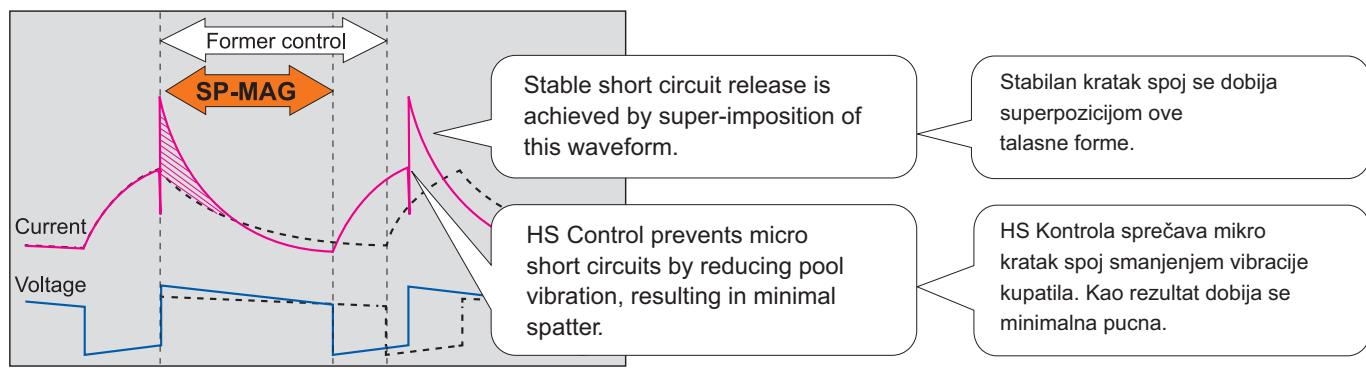
### SP-MAG

#### Prednosti:

- 30% manje pucne od standardnog SP-MAG procesa, kombinovanjem HS (Hyper Stabilization) i sekundarne prekidačke kontrole.

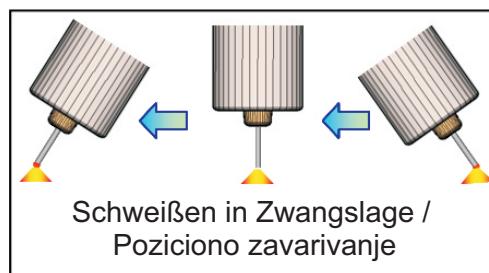
#### Benefits:

- Achieves 30% less spatter than the original SP-MAG process through a combination of HS (Hyper Stabilization) and secondary switching control.

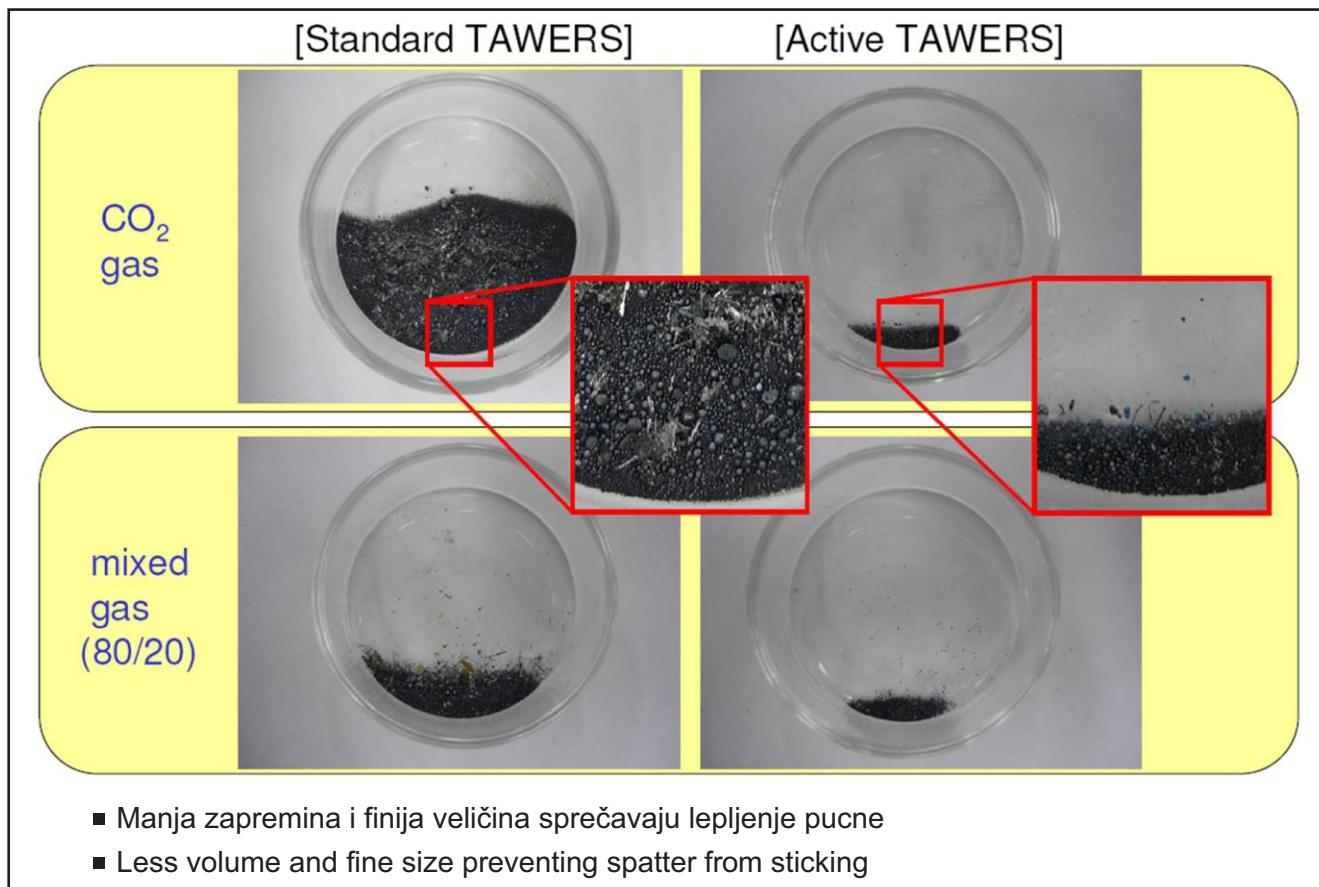




- Manje pucne i rasprskavanja pri zavarivanju
- Količina nalepljene pucne na komadima je smanjena finijom granulacijom i manjom zapreminom kapljica
- Smanjeno rasprskavanje pri nepovoljnim pozicijama gorionika, na nepristupačnim mestima i teško dostupnim uglovima
- Izuzetan kvalitet pri zavarivanju tankih materijala
- Pulsiranje žice omogućava zavarivanje bez pucne i u slučajevima pozicionog zavarivanja
- Stvaranje pucne je 80% manje pri propaljivanju na 200A u zaštiti mešavine gasova
- Izuzetan kvalitet pri CO<sub>2</sub> zavarivanju. 90% manje pucne pri propaljivanju na 200A



- Reduction of spatter generally
- Excellent quality by welding with thin plate
- Reduction of spatter on the components due to small volume and fine sized grains
- Reduction of spatter also by an unpropitious position of the burner like sagging or pricking due to bad weld accessibility
- Pulsed-wire offers welding without any spatter also at out-of-position welding
- High quality at CO<sub>2</sub> welding. 90% lower spatter generation by arc start with 200A
- 80% lower spatter generation by arc start with mixed gas at 200A



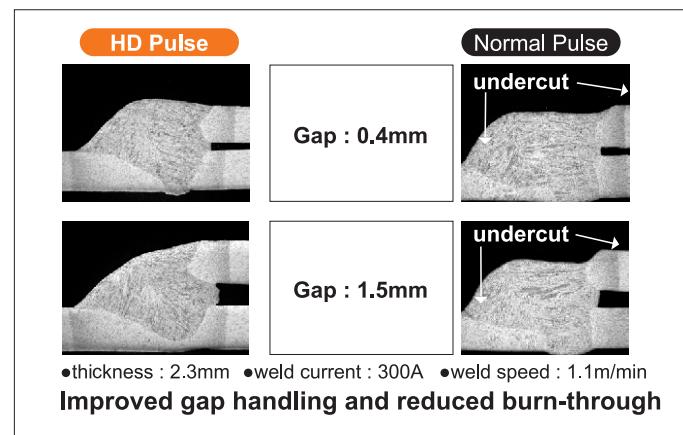
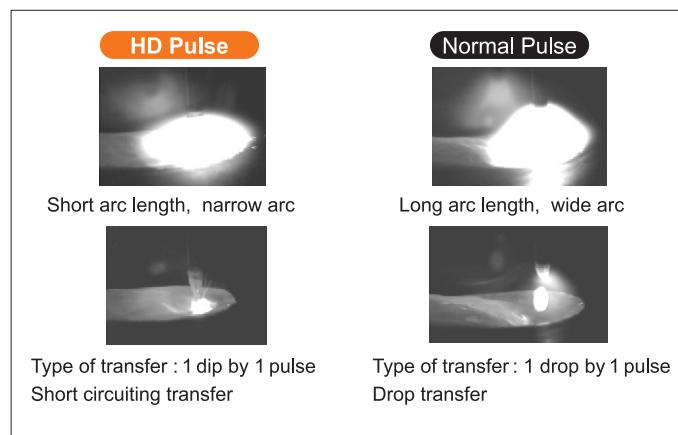
## Hyper Dip Puls (HD-Puls) Hyper Dip Pulse (HD-Pulse)

### Prednosti:

- Zavarivanje velikom brzinom uz minimizaciju zajeda
- Dvostruka frekvencija
- Erweitert die Möglichkeiten beim Pulsschweißen
- Ermöglicht kurzen Lichtbogen, der für die höhere Stabilität sorgt und die Abweichung des Lichtbogens reduziert

### Benefits:

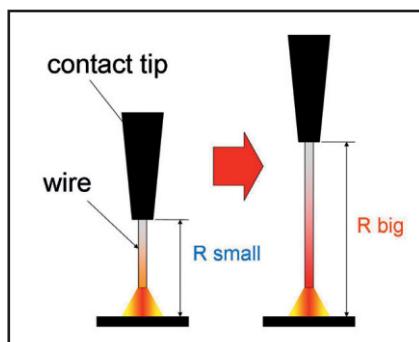
- High speed welding with minimized undercuts
- Double frequency of dips allows less spatter and perfect gap handling
- Expands the possibilities of pulse welding
- Allows shorter arc length which increases stability and minimizes the effects of arc blow.



## MAG-HEAT



Poboljšano rastapanje korišćenjem I<sup>2</sup>R Efekta. Što je duži slobodan kraj žice, to je veći otpor R. Ova karakteristika pojačava efekat zagrevanja „Heat Effect“ što omogućava da sa istom strujom dobijemo bolje rastapanje. Čuvanje energije ne doprinosi samo očuvanju sredine, već snižava proizvodne troškove.



Improvement of the melting rate by using the I<sup>2</sup>R effect. The longer the free wire length, the higher the resistance R. This improves the “Heat Effect”, ensuring that with the same welding current it becomes possible to produce a higher melting rate. The energy conservation not only saves the environment but also reduces your costs.

Prilagođavanje sa MAG na MAG HEAT je vrlo jednostavno. Zahteva posebnu diznu "HEAT", bužir i HEAT software (YA-1QPME1).

The modification from MAG to MAG HEAT is easily achievable. It simply requires the HEAT contact tip, liner, core and the HEAT software (YA-1QPME1).

Omogućava zavarivanje pocinkovanih komada uz minimalnu pucnu.  
Postoje dva procesa bazirana na Zi-Tech tehnologiji:  
**Zi-Tech HD-Puls i Zi-Tech Active Wire Prozess.**

- Sa Zi-Tech HD-Puls procesom, pocinkovani limovi se mogu zavarivati uz minimalno pucne i u poređenju sa standardnim CO<sub>2</sub> zavarivanjem količina pucne se može sniziti do 63%.
- Sa Zi-Tech Active Wire Proces-om u zaštiti CO<sub>2</sub> gasa, moguće je smanjiti količinu pucne do 81%, u poređenju sa standardnim zavarivanjem u zaštiti CO<sub>2</sub> gasa.

Allows low-spatter welding of zinc coated work pieces.

Therefore two processes of Zi-Tech are available:

**Zi-Tech HD-Pulse and Zi-Tech Active Wire Process.**

- With the Zi-Tech HD-Pulse zinc coated steel can bee low-spatter welded with mixed gas and compare to Standard Co<sub>2</sub> welding it's possible to achieve a spatter reduction og up to 63%.
- The Zi-Tech Active Wire Process allows a further spatter reduction of up to 81% by using Co<sub>2</sub> as shielding gas in compare to Standard Co<sub>2</sub> welding.

**TAWERS™**  
The Arc Welding Robot System  
**Pull AC-MIG Zavarivanje**  
**Pull AC-MIG Welding system**

- Sa Push/Pull funkcijom je moguće zavarivanje ultra tankih aluminijumskih limova (0.6 - 20 mm)
- Poboljšano upravljanje zazorima - omogućava popunjavanje zazora do 2mm na limovima debljine 2mm
- Optimalni rezultati zavarivanja - savršen spoj sa brzinama do 3 m/min
- MIG software omogućava Sinhronizovani puls i funkciju Spiralnog njihanja.
- Struja zavarivanja može biti odabrana u zavisnosti od različitih pozicija, pomoću pendlovanja ili spiralnog kretanja
- Materijali različitih debljina se mogu uspešno zavarivati kombinovanjem niže i više struje zavarivanja.
- Dodatno poboljšanje procesa zavarivanja se može dobiti korišćenjem Wire Booster-a

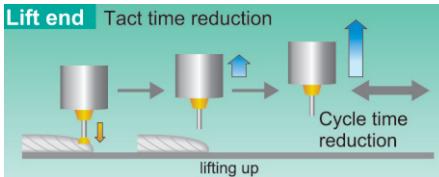
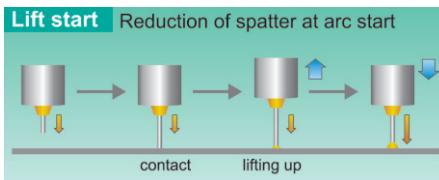
- Ultra-thin aluminium plate welding (0.6 -20 mm) with Push/Pull function
- Improved gap handling – For a 2 mm plate it is possible to handle a 2 mm gap
- Optimal weld results – perfect bead with welding speed up to 3.0 m/min
- MIG software offers the Synchronic Pulse and Spiral Weave Function
- Welding currents can be chosen randomly in different positions by pendulum or spiral movement
- Lower or higher weld currents for optimal connection of different material thickness
- Additional improvement of wire feeding can be realized by using the Wire Booster



# STANDARDNE FUNKCIJE / STANDARD FEATURES

## Lift Start / Lift End Funktion

Robot brzo podiže goronik na početku i kraju zavara. Uz koordinaciju kretanja robota sa njihanjem goronika i kontrolom dodavanja žice pri zavarivanju, značajno je poboljšan kvalitet zavarenog spoja i skraćeno je vreme ciklusa.



## Lift Start / Lift End function

The robot lifts up the welding torch quickly at the start and end of the weld. By co-ordinating the robot motion with the welding waveform and wire feed control, quality and cycle time are improved.

## Zaštita manipulatora od sudara/kolizije

Praćenje svih 6 osa. Nakon registrovanja kolizije fleksibilna kontrola apsorbuje udar kako bi robot i objekat sa kojim je došlo do kontakta ostali zaštićeni.



## Manipulator collision guard

Monitoring of all 6 axes. After collision is detected the flexible control absorbs the external impact whereby robot and disturbing source are being protected.

## Testiranje programa

Operater bezbedno može proveriti program, uključujući i zavarivanje bez prebacivanja sistema u automatski mod.

## Funkcija praćenja zavarivanja

Ova opcija prati parametre zavarivanja i upozorava ukoliko se oni razlikuju od opsega parametara zadatih od strane operatera.

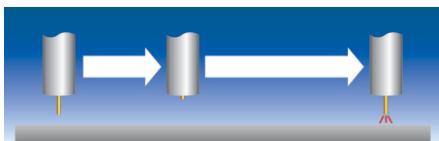
## Funkcija preklapanja zavara

U slučaju prekida, tokom CO2/MAG zavarivanja, goronik se ponovnim startovanjem vraća u prethodnu tačku gde je zavarivanje prekinuto.



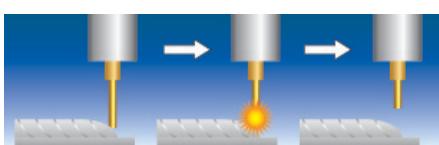
## Funkcija automatskog uvlačenja žice

Prilikom kretnje robota do tačke početka zavarivanja, žica se automatski uvlači; kako bi se poboljšalo propaljivanje luka.



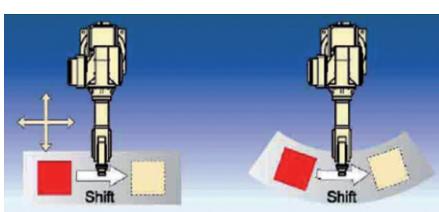
## Funkcija odlepljivanja zavarene žice

Automatski prepoznaće da je žica zavarena u tački završetka zavarivanja i ponovo propaljuje luk kako bi se žica oslobođila.



## Paralelno pomeranje + rotacija RT ose

Vreme programiranja/učenja robota na istom komadu je značajno kraće korišćenjem ove opcije.



## Kretanje naginjanjem

Ova funkcija dozvoljava kretanje robota na unapred definisanom rastojanju, svakim pomeranjem upravljačkog točkića. Ova opcija je posebno korisna kada se radi u nepristupačnom i ograničenom prostoru i pri finom podešavanju pozicije.

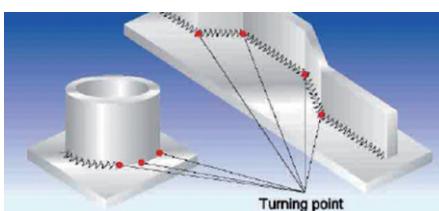
## Ponovni pokušaj uspostavljanja luka

Prepoznaće neuspešno propaljivanje luka i automatski počinje ponovno propaljivanje.



## Funkcija njihanja

Da bi se koristilo njihanje, potrebno je samo podesiti početnu tačku, amplitudu, tačke skretanja i završnu tačku zavarivanja. Ovakav način programiranja značajno štedi vreme.



## Pitch Movement

This function enables robot movement at a pre-set distance by every click of the jog dial. This is useful when working in narrow, constricted spaces or in fine-tuning robot position.

## Arc start retry function

Detecting a failure of arc start, the robot automatically starts arc ignition again.

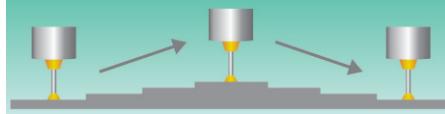
## Weaving function

To create a weaving pattern, you just have to teach the starting point, amplitudes, turning point and ending point. Teaching time will be reduced.

# DODATNE FUNKCIJE/OPTIONAL FEATURES

## Praćenje visine materijala

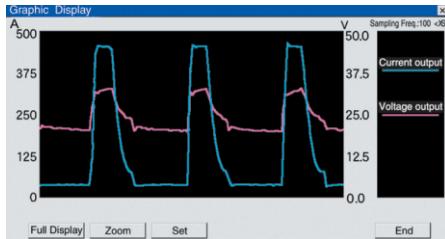
Jednostavno programiranje kod nepravilno oblikovanih komada i praćenje materijala deformisanog unosom topote. Robot prepoznaće promene u «stick-out»-u i automatski se prilagođava.



## Registar parametara zavarivanja

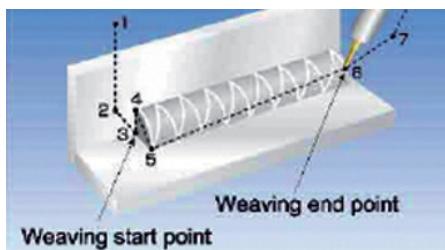
Preddefinisani i stvarni parametri zavarivanja se unose u registar, sinhronizovani sa programom zavarivanja. Ovom funkcijom se može pratiti sledljivost parametara zavarivanja.

I	M	S	Prog	Posi	A	V	Speed	ReA	ReV	Sht	Error	AD	VD	SD
13	16	34	Prog0023	P2	120	18.1	0.50	122	16.2	78	0	0	0	0
13	17	45	Prog0023	P4	120	18.1	0.50	141	16.8	89	0	0	0	0
13	17	46	Prog0023	P6	120	18.1	0.50	123	16.1	76	0	0	0	0
13	21	15	Prog0023	P4	120	18.1	0.50	139	16.7	81	0	0	0	0
13	24	0	Prog0023	P2	120	18.1	0.50	122	16.2	78	0	0	0	0
13	26	38	Prog0023	P4	120	18.1	0.50	141	16.8	89	0	0	0	0
13	26	47	Prog0023	P2	120	18.1	0.50	123	16.2	80	0	0	0	0
13	28	44	Prog0023	P6	120	18.1	0.50	144	16.9	76	0	0	0	0
13	32	58	Prog0023	P2	140	16.8	0.50	141	16.8	81	0	0	0	0
13	33	49	Prog0100	P4	140	16.8	0.50	151	16.8	90	1	0	0	0
13	33	56	Prog0100	P2	140	16.8	0.50	141	16.8	70	0	0	0	0
13	35	54	Prog0100	P4	140	16.8	0.50	150	118	89	0	0	0	0
14	9	53	Prog0023	P2	120	18.1	0.50	122	16.2	73	0	0	0	0
14	28	53	Prog0023	P9	120	18.1	0.50	121	16.2	on	0	0	0	0



## Arc senzor

Arc senzor registruje odstupanja u parametrima, tokom postupka zavarivanja i automatski ih koriguje.



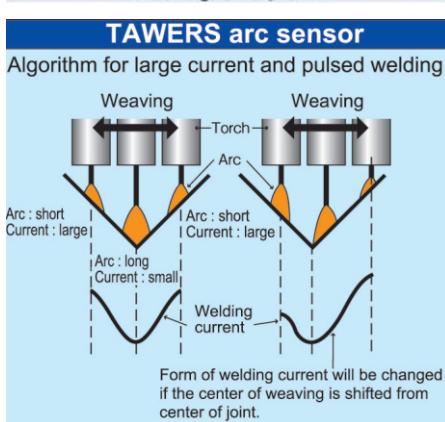
## Touch senzor

Registruje odstupanje između definisane i stvarne početne tačke zavarivanja i koriguje putanju.



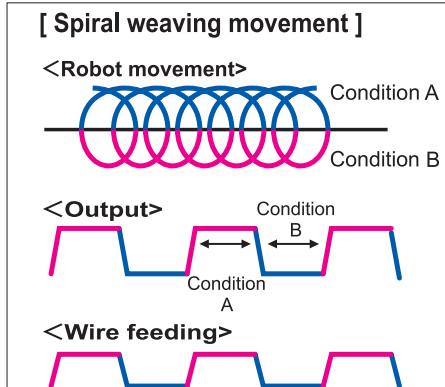
## TAWERS za srednje i debele limove

Motor za dodavanje žice sa visokim brtним momentom i visokom brzinom, postiže precizno i brzo dodavanje žice.



## Harmonično kretanje

Panasonic nudi software-ska rešenja koja pružaju mogućnost harmonizovanog kretanja između eksternih osa i robota ili više robota međusobno. Software osigurava da relativne brzine i relativne putanje budu međusobno sinhronizovane.



## TAWERS funkcija spiralnog njihanja

Spiralno njihanje rezultuje idealnim zavarenim spojem pri zavarivanju aluminijuma MIG postupkom, sinhronizovanjem izlaza i brzine dodavanja žice. Ova opcija uključuje YA-1QPMM1 (TAWERS Aluminium MIG funkciju) i YA-1QPMM1T01 (TAWERS funkciju sinhronizovanog njihanja sa pulsnom strujom).

## Auto Extension Control

Simplified teaching for odd-shaped work and adaptive control for heat distortion compensation. Robots detects changes in stick-out and compensates automatically.

## Weld log function

Preset and actual welding waveform data is logged in synchronization with the weld program. Traceability can be performed within this single tool.

## Waveform display function

The welding waveform data can be stored and displayed on the robot pendant for analysis.

## Arc sensor unit

The arc sensor detects deviation of welding current in weaving welding operation and corrects them automatically.

## Touch sensor unit

The touch sensor detects deviation between the taught weld start point and the actual weld start point and corrects.

## TAWERS for middle and thick plate

High-torque, high-speed feed motor achieves accurate high-speed wire feeding.

## Harmonic movement

Panasonic offers software solutions which make it possible to realize harmonic movement between external axis and robot or multiple robots. The software ensures that, the relative speeds and the relative trajectory are synchronized with each other.

## TAWERS spiral weaving function

Spiral weaving movement produces ideal bead appearance in aluminium MIG welding by synchronizing with welding output and wire feed speed. Included in this option are YA-1QPMM1 (TAWERS aluminium MIG function) and YA-1QPMM1T01 (TAWERS synchronous weaving low-pulse function).



## TA-Serija/ TA-Series

Specifikacija / Spezifikations G / WGH

Model / Model	TA-1000	TA-1400	TA-1600	TA-1800	TA-1900
Tip ruke / Arm Type	Kratka / Short	Standardna	Srednja / Middle	Duga / Long	Duga / Long
Max..Nosivost / Max. Payload (kg)	6	6	8	8	6
Max. Hod / Max. Reach (mm)	1068	1374	1598	1796	1895
Ponovljivost / Repeatability	± 0,1 mm ili manje / or less				



TB-1400WG



TB-1800WG

## TB-Serija / TB-Series

Gorionik sa poveznim paketom uključen / Torch cable integrated

Specifikacija / Spezifikations WG / WGH

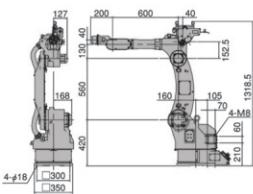
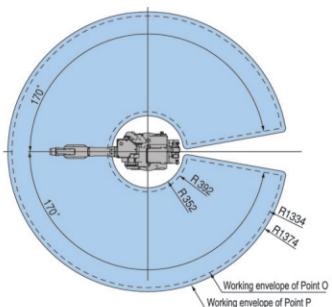
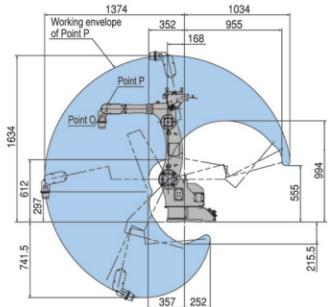
Model / Model, Nosivost / Payload	TB-1400	TB-1800
Tip ruke / Arm Type	Kratka / Short	Duga / Long
Max.Nosivost / Max. Payload (kg)	4	4
Max. Hod / Max. Reach (mm)	1437	1802
Ponovljivost/ Repeatability	± 0,1 mm ili manje / or less	

**experts in productivity**

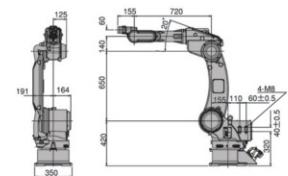
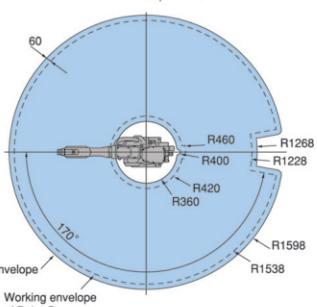
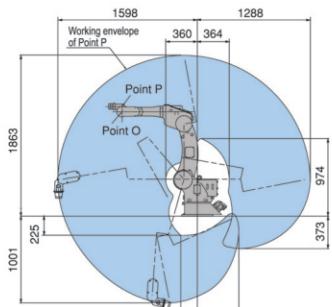
# Radni prostor / Work Envelope

## **Specifikacije / Spezifikations**

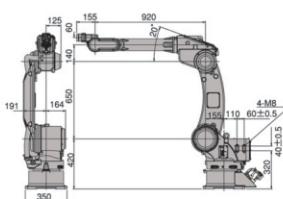
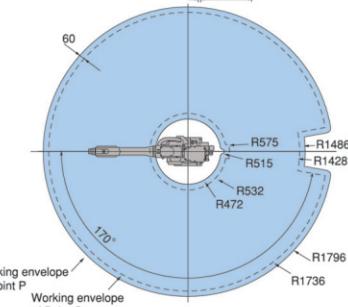
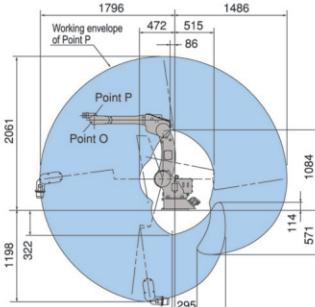
TA-1400



TA-1600

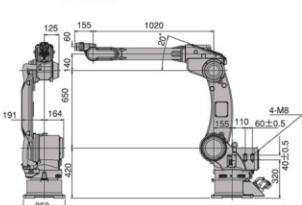
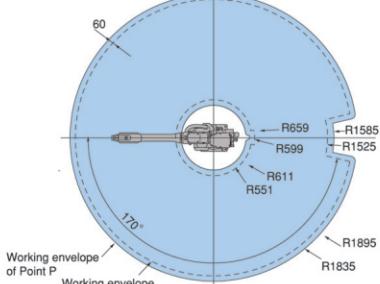
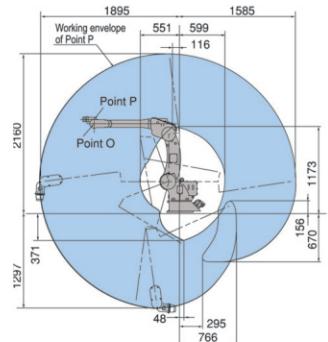


TA-1800

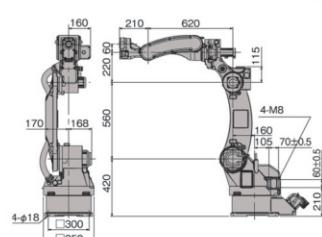
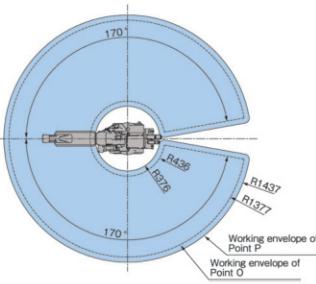
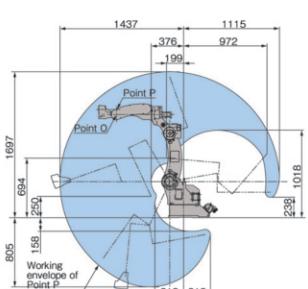


Boden- oder Deckenmontage/ Montaža podno ili nadglavno

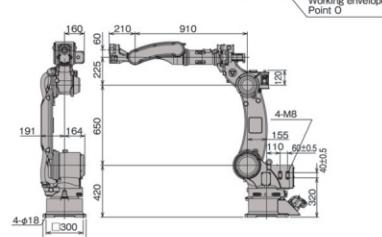
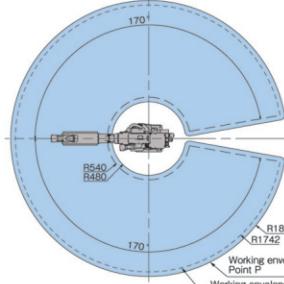
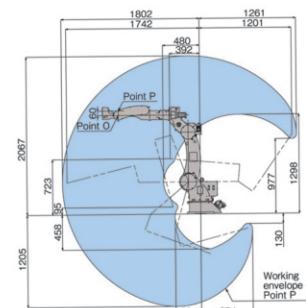
TA-1900



TB-1400



TB-1800



## KONTAKT

Da li su vam potrebne dodatne informacije vezane za TAWERS robote za zavarivanje? Molimo da nas kontaktirate.

## CONTACT

Would you like more information on our TAWERS Robot Welding system? Please contact us.

# Panasonic

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Sertifikovani Partner od: / Certified partner of  
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