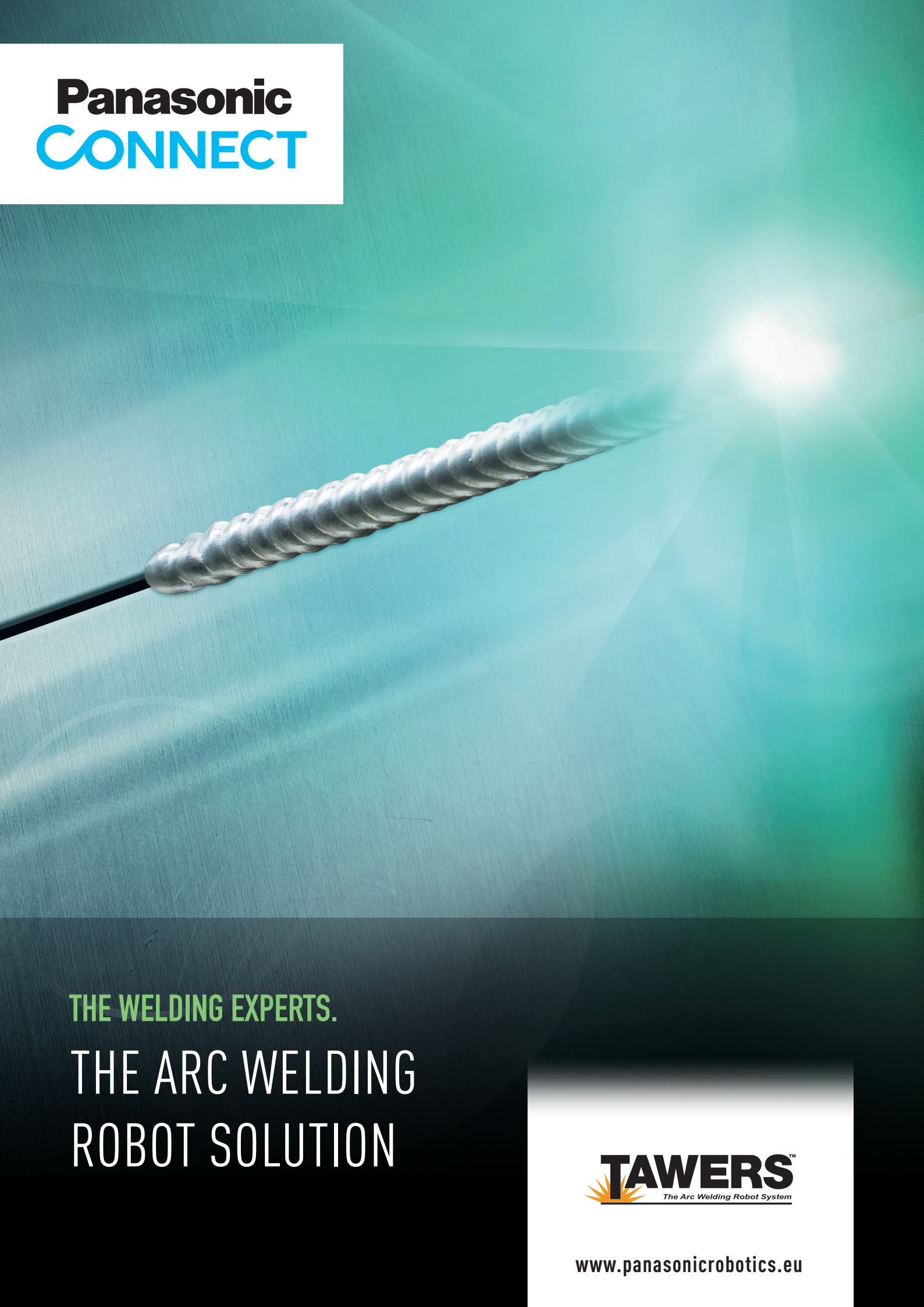
Panasonic
CONNECT



THE WELDING EXPERTS.

THE ARC WELDING ROBOT SOLUTION

TAWERS™
The Arc Welding Robot System

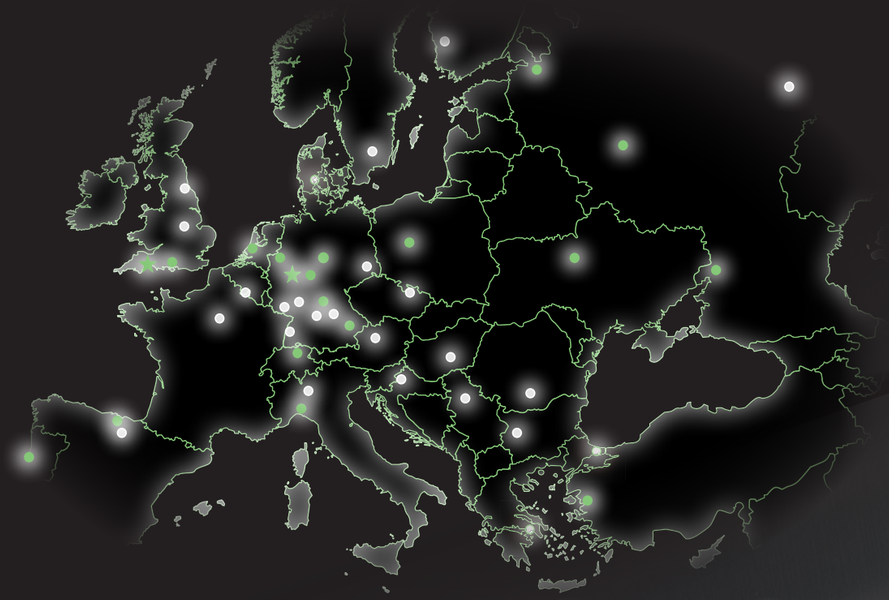
www.panasonicrobotics.eu

COMPANY PROFILE

Panasonic develops since 1957 welding technology products and is nowadays worldwide present in the field of MIG/MAG/TIG and robot welding. The Panasonic Robot & Welding Europe is the European Distributor for products all about welding. The headquarter is located in Neuss near Düsseldorf and offers a big training room, a welding test area and the center of excellence for robot and welding systems. With a huge distributor Network Panasonic is almost represented in every European country. It is our aim to support the entire industry with “All from one manufacturer” solutions in the field of welding robot applications.

PRODUCT & SERVICE

Panasonic offers a turnkey welding system for arc welding – with welding and handling robots, welding power sources, welding torches and more Panasonic Covers a wide range of industrial applications. The robot systems are equipped with robots of the TM-WG3 range (TAWERS systems with an integrated welding powersource) or the TM-G3 range (robots with an external digital Panasonic power source). Whether general orautomotive industry Panasonic always offers the best solutions of products to be manufactured in cooperation with customers.



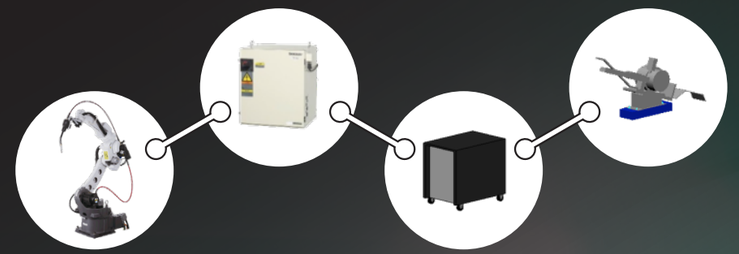
TAWERS™
The Arc Welding Robot System

THE ARC WELDING ROBOT SOLUTION

TAWERS is the fusion of robot and controller fused with welding power source and servo wire feeder to one unit for MIG/MAG/TIG welding. Direct bus communication software monitored welding control eliminates the calibration of the welding. Faster, better and worldwide unique. All from one manufacturer that pays off.

Before there were only concepts for welder – we have a concept only for robots.

REGULAR DIGITAL COMMUNICATION



TAWERS™
The Arc Welding Robot System

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TAWERS – SIMPLY EXPLAINED

Arc, robot and servo wire feeder motor are monitored and controlled by the robot controller.

HEADLINE

- Two performance classes
- Modular base concept
- Up to 10 welding methods from the MIG, MAG and TIG range
- One power source for all materials
- Continuous adjustment of all parameter
- Easy handling of parameter by Weld Navigation

HEADLINE

- 64 Bit CPU
- Ethernet connection, optional
- Device Net, Profibus-Modul Slave, CC-Link
- Digital connection up to 5 external powersources
- Standard Features 40 E/A and memory 40.000 Points

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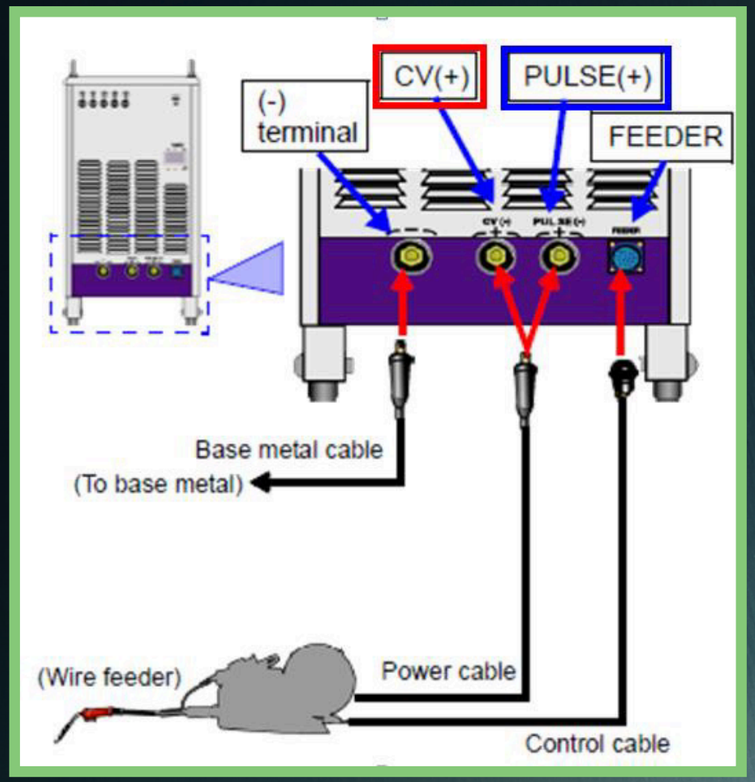
ARC CHARACTERISTICS

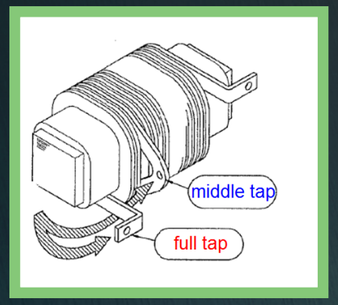
In general major characteristics of arc welder is defined by the “reactance” (or DCL) in the power supply.

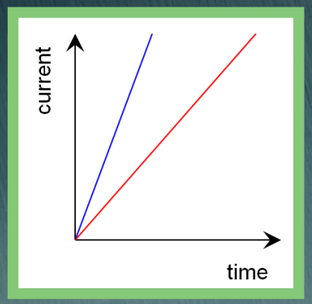
- Larger reactance : softer arc (for CV)
- Smaller reactance : stronger arc (for Pulse)

To change arc character between different welding processes, some welder has multiple output terminal (DCL tap) with different reactance.

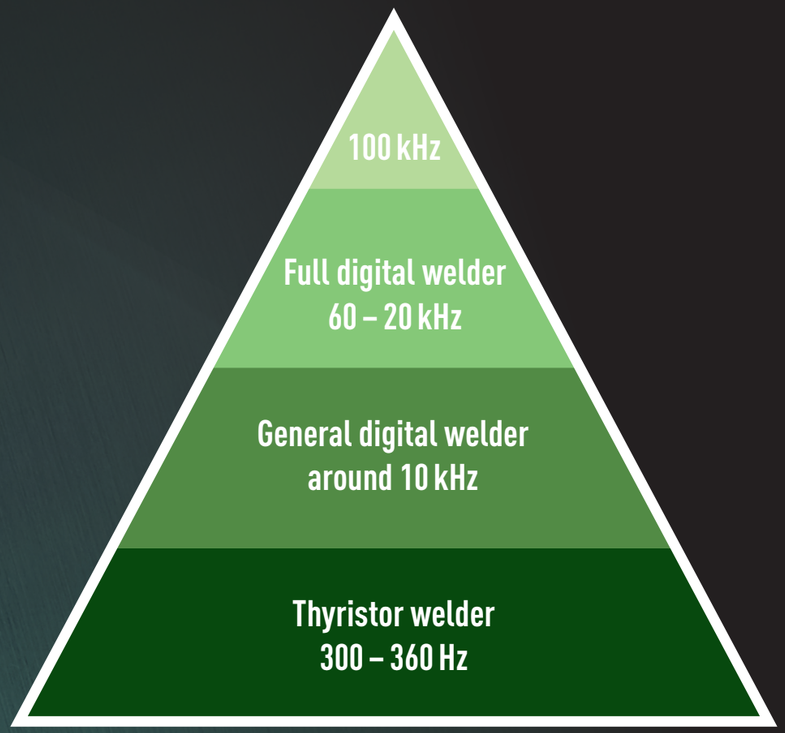
- In order to change arc character without changing CDL tap, welder needs to be smart enough to control voltage/amperage output quickly.
- This quick control is only achieved by increasing inverter frequency.







100 kHz INVERTER WELDER



Welder control speed

Advanced low spatter welding process both requires quick and slow reaction depending on the sequence of the arc. Changing arc characteristics within the same process is only achieved by controlling reactance by software not relaying on hardware DCL.

- World fastest [100kHz] inverter circuit.(*1)
- Controls waveform precisely 100,000 times per sec. (every 10μs)
- Creating ideal weld waveform contributes to quality welds including arc stability, low spatter and uniformed bead shape.

(*1) Primary side. (200kHz secondary side) [Inverter frequency] is a key to determine welder performance. Higher frequency requires technology to reduce heat generation during high speed control.

FULL DIGITAL COMMUNICATION

DIGITAL COMMUNICATION

512 kb/s or less

TAWERS BUS COMMUNICATION

4.5 Mb/s

1

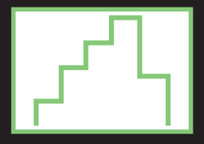
4.5 Mb/s

4.5 Mb/s

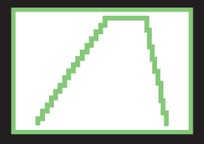
4.5 Mb/s

16

DESIRED WAVEFORM

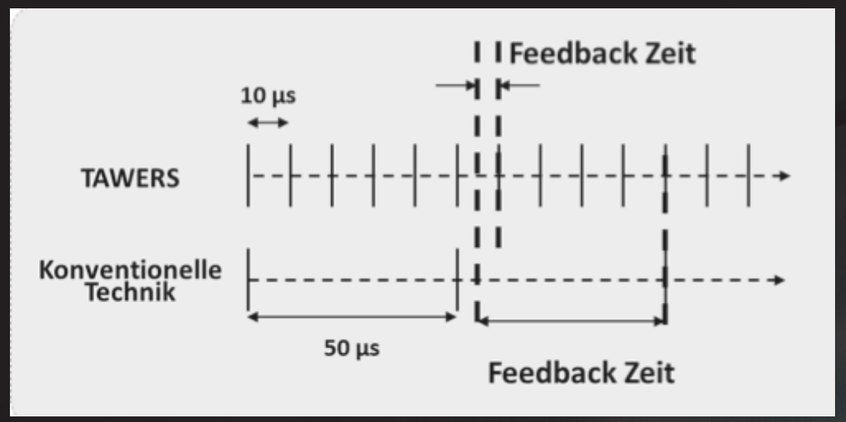


CONVENTIONAL CHOPPING



TAWERS CHOPPING

COMMUNICATION EVERY 10 µS



TAWERS™ The Arc Welding Robot System

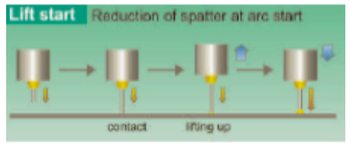
SERVO CONTROLLED WIRE FEED MOTOR

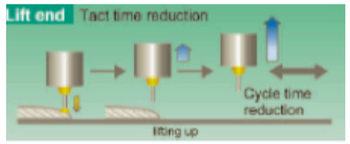
- The only in the market, TAWERS uses servo motor standard for wire feeder.[*1]
- Controlling wire feeder precisely like controlling manipulator will not only stabilizes wire feeding but also synchronizes the arc even during wire feed speed change.
- Achieving Arc Slope function or full control low
- Active Wire-feed Process cannot be achieved without servo control.

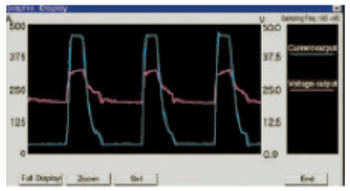
(*1) General welder uses DC motor. Full Digital Welder uses DC motor with encoder feedback.

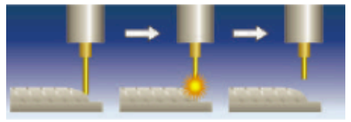
A servomotor is a rotary actuator that allows for precise control of angular position. It consists of a motor coupled to a sensor for position feedback, through a reduction gearbox. It also requires a relatively sophisticated controller, often a dedicated module designed specifically for use with servomotors.

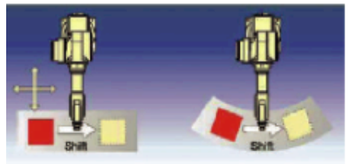
STANDARD FEATURES

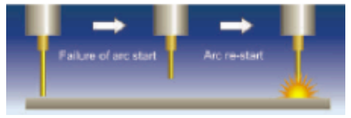












LIFT START / LIFT END FUNCTION
The robot lifts up the welding torch quickly at the start and end of the weld. By coordinating the robot motion with the welding waveform and wire feed control, quality and cycle time are improved.

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.

PROGRAM TEST
Operator can safely verify taught program including welding without switching to automatic mode.

WELD MOTOR FUNCTION
This function monitors the welding process and warns of violations via user-defined process control limits.

OVERLAP FUNCTION
In case of interruption during CO2/MAG welding, the torch is stepped back by reboot and resumes the welding from the ending point of welding.

AUTO RETRACT FUNCTION
As the robot moves to weld start points, the wire is retracted automatically; thereby improving arc start.

WIRE STICK AUTO RELEASE FUNCTION
Automatically detects a wire stuck at the end of a weld and re-ignites the arc to release the wire.

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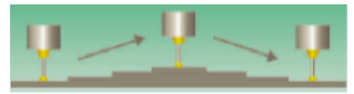
PARALLEL SHIFT + RT AXIS ROTATING
Teaching time of same workpiece is drastically reduced by these functions.

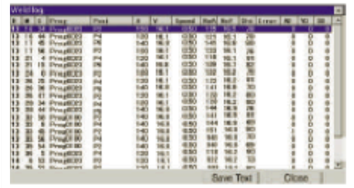
PITCH MOVEMENT
This function enables robot movement at a pre-set distance by every click of the jog dial. This is useful when working in narrow, constricted spaces or in fine-tuning robot position.

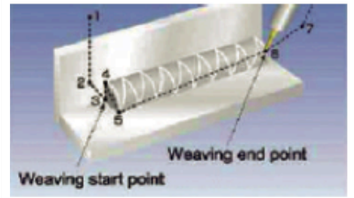
ARC START RETRY FUNCTION
Detecting a failure of arc start, the robot automatically starts arc ignition again.

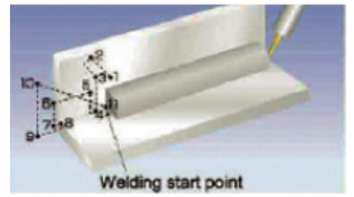
WEAVING FUNCTION
To create a weaving pattern, you just have to teach the starting point, amplitudes, turning point and ending point. Teaching time will be reduced.

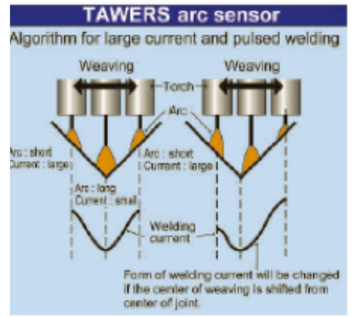
OPTIONAL FEATURES

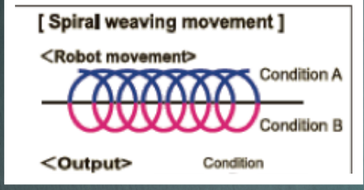












AUTO EXTENSION CONTROL
Simplified teaching for odd-shaped work and adaptive control for heat distortion compensation. Robots detects changes in stick-out and compensates automatically.

WELD LOG FUNCTION
Preset and actual welding waveform data is logged in synchronization with the weld program. Traceability can be performed within the 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 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).

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