



AWS3 Servo Motorised Active Welding System

The AWS3 Active Welding System combines servo motorised weld heads / weld pincers (MFP-series) with an inverter power supply (ISQ-series) and a numeric motor control (MNC-series) all in one unique system. Its various interfaces make AWS3 an easy to integrate system for automation.

ACTIVE WELDING SYSTEM 3 SERVO MOTORISED

The Active Welding System is available as standard or with displacement force measurement version. It includes four main components, which are an operating panel, a welding control, a motor control, a weld head such as MFP60 or a weld pincer such as MFP400-Z.

The AWS3 can control 1 or 2 weld heads or weld pincers depending on the configuration selected. An additional pneumatic lower stroke unit is available.

Automatic calculation and monitoring of critical values, programming of weld power and weld force profiles as well as the static and dynamic process monitoring are critical elements to achieve optimum welds. The AWS3 combines these elements into one premium system that enables quick and precise parameter settings.

Remote control services are available for all AWS3 versions and allow the Amada Miyachi Europe technical service experts to trouble shoot several devices on-site or to perform a prompt root cause analysis from long distance by Amada Miyachi Europe technical experts minimising maintenance cost and giving maximum uptime.

The complete system is an integrated solution providing process control, monitoring and quality analysis all in one.

The multilingual user interface as well as operating concept are very intuitive and offer an intelligent design, a status line, a menu bar and an interactive user guide with help functions. It has a graphical colour display, status LED, a USB Port and can be operated in various languages. This makes it an intelligent easy to use system.

Pushing a button allows saving and transferring of critical parameters such as system configuration, data logging and screen shots on a USB stick.

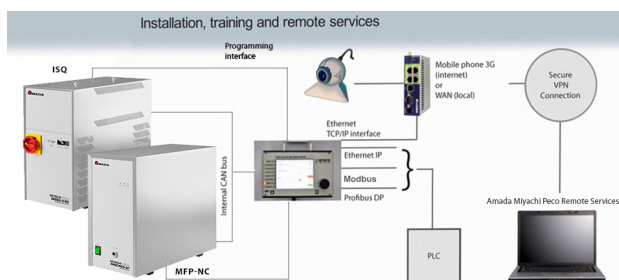
Integrated process control is ensured for all electrical and mechanical welding parameters i.e. for current, voltage, power time, force and distance.

AWS3 realises production monitoring through data logging, static and dynamic monitoring, troubleshooting, fault history and statistical process control (SPC). Process stability can be achieved using histogram and run-chart screens.

Reference waveform management and process analysis with SPC provide an integrated and reliable quality analysis.

The digital operator or control panel is a robust and very user-friendly device (optional touch panel).

The new remote diagnostics feature allows customers with several AWS3 to monitor production of various workstations and enables Amada Miyachi Europe technical service to check, adjust and record technical issues or do maintenance from long distance.



PRODUCT OVERVIEW

The MIYACHI PECO Active Welding System includes the following components:

Criteria	AWS3 servo motorised - Basic	AWS3 servo motorised - Advanced
Features		
Graphical waveform		x
SPC		x
Process monitoring	static	static, dynamic
Data logging		x
Communication		
Digital I/O	x	x
RS 232	x	x
Ethernet TCP/IP	x	x
Modbus TCP		x
Profibus or Ethernet IP		Optional
Control		
Two separate weld heads (figure 4)	Second motor control required	
Dual weld head series, step (figure 5)	Second motor control required	
Force control	x	x
Force monitoring	x	x
Displacement monitoring	x	x
Hardware		
Operating panel (figure 3)	Operating panel OP-AWS3 or Touch screen TP-AWS3	
Motor control (figure 2)	MFP-NC-AWS3	
Weld heads (figure 5)	MFP25, MFP60, newhorizon™ servo motorised weld heads MFP400, MFP800	
Weld pincers	newhorizon™ weld pincers MFP400-Z or MFP800-Z	
Compacting modules	C16, C25 and C70	
Welding control DC (figure 1)	ISQ20-3, -6, -10 or -20	
Welding control AC	ISQ20-8	



figure 1: ISQ20



figure 2: MNC400



figure 3: Touch screen panel TP-AWS3

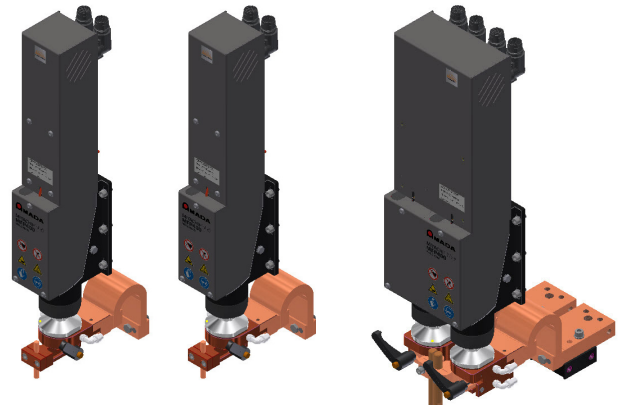


figure 4: Two separate MFP400 weld heads

figure 5: MFP400 dual weld head

TECHNICAL SPECIFICATIONS

WELDING CONTROL

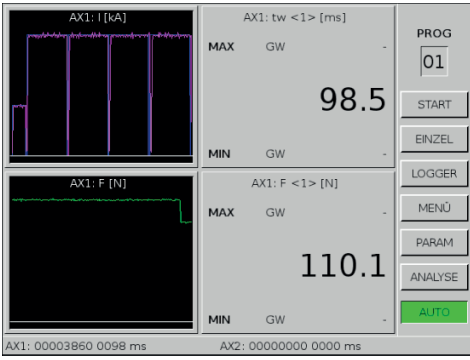
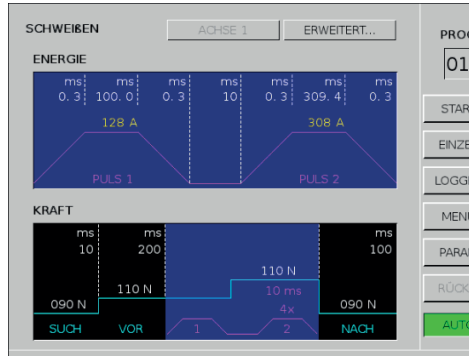
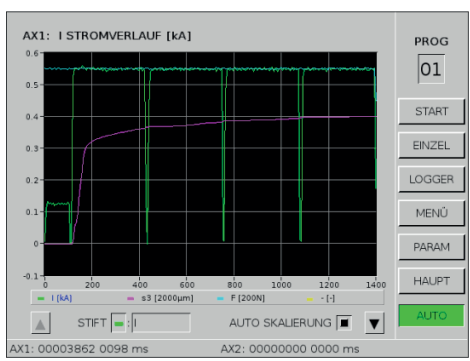
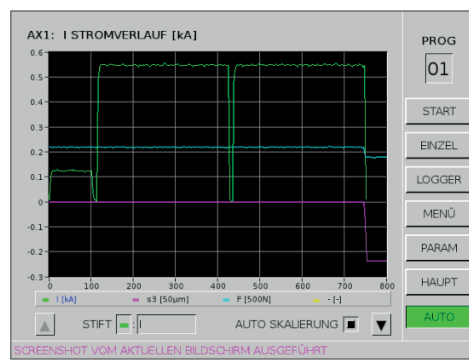
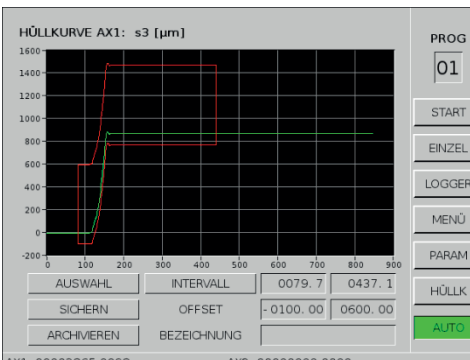
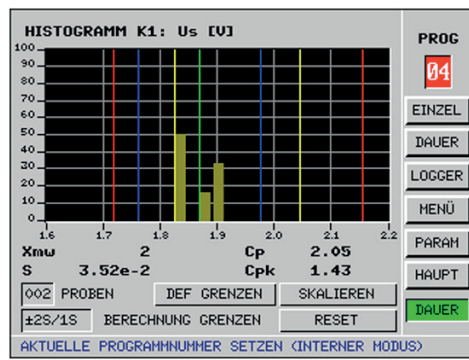
ISQ20	as a compact unit:	
	ISQ20-3-DC	for 3 kA
	ISQ20-6-DC	for 6 kA
	ISQ20-10-DC	for 10 kA
	ISQ20-20-DC	for 20 kA
	ISQ20-8-AC	for 8 kA

The ISQ20 is a weld control, which contains the mains switch, the power and the control electronics. The transformer rectifier block is an extra component for ISQ20-8, ISQ20-10 and ISQ20-20.

General	ISQ20-3 and ISQ20-6	ISQ20-8, ISQ20-10 and ISQ20-20
Weld current type	Controlled DC inverter current	AC or DC inverter
Configuration	Compact version w/integrated transformer, voltage sensor cable 19" plug-in unit ISQ20-MFC (optional)	Compact version w/voltage sensor cable; transformer not included
Supply voltage	3 x 400 V 3 x 230 V 3 x 440-480 V	3 x 400 V 3 x 440-480 V
Mains frequency	50-60 Hz	
Protection class	IP30	
Control / control mode	Current, voltage or power feedback control, independently adjustable independently for each pulse, APC (Active Part Conditioner) function and current, voltage, performance and energy limits	
Programmable weld schedules / external weld schedule selection	99 at single axis; 49 per head at dual axis	
# of weld pulses	1st and/or 2nd pulse, 2nd pulse can be repeated max 10 times (decrease adjustable down to 1% of 2nd pulse)	
Weld pulse control	Up slope, weld-time, down-slope	
Current measurement	Integrated toroidal coil (Rogowski coil)	external toroidal coil
Voltage measurement	Potential free, external connection (X10 axis/head 1; X11 axis/head 2)	
Monitoring features	Monitoring limits for U, I or P; + and – tolerance windows individually adjustable; advanced parts check with APC function, pre-weld check and current limit with oxidized parts; audio-visual display shows upper and lower limits, time limit and welding energy limit with sensitive components; independent monitoring of current, voltage, power and energy individually for each pulse; display measurements on panel	
Force measurement	Internal	
Displacement measurement	Internal	
Operation	One toggle wheel, colour display, Optional: Profibus or Ethernet IP or optional touch screen	
Weld transformer	internal	external
Analog in- and output	Pressure sensor and proportional valve, 0-10 VDC	
Data links (partly on display unit)	Digital I/O, RS232, Ethernet TCP/IP and USB port see AWS3 standard incl. Modbus, Profibus or Ethernet/IP are optional	
Binary interface input	Configurable setting of e.g. start, quick-stop, proximity switches, pressure sensor, locking cylinder	
Binary interface output	Configurable settings of ready, locking, stepping contact, counter, set point deviation, closing stroke, welding pressure,	
Environment temp.	0 - 40 °C	
Cooling	Air-cooled, external transformer water-cooled	
Legal approval	CE	

*Power Data: Weld Voltage: 4 V at 6 kA, Open-circuit: 10 V, Inverter frequency: max 20 kHz Nominal Power, Max Power Rating and max weld current differ as per ISQ20 version selected, Max weld or pulse period (with 2-impulse weld cycle): 620 ms

OPERATING PANEL

Configurable run screen	Configuration of weld parameters
<p>The high resolution colour display and user configurable run screen enables users to configure the display to show information relevant to their particular job function or chosen welding environment. The AWS3 is operated easily by turning and pushing the toggle wheel. Up to 99 programs for various parameter settings can be stored.</p>	
	
Welding oscilloscope functions / process development *)	"Snapshot" saving function to usb stick
<p>The AWS3 can be used as oscilloscope for analysing measured waveforms and for comparing measuring values. This can be done all in a single screen using different pen colours for up to four traces.</p>	<p>Pushing a button saves the current screen as .bmp on a USB stick. Waveforms can be saved as .csv for evaluation. All parameter settings can also be stored as backup file on a USB stick. Standard interfaces are Digital I/O, RS 232, Ethernet TCP/IP and Modbus TCP. The AWS3 Advanced version offers additionally as optional interfaces Profibus and Ethernet IP.</p>
	
Dynamic process monitoring with envelope function *)	Statistical process control (spc) and quality assurance *)
<p>Reference waveforms can be automatically averaged from numerous welds and results may be used to specify envelope limits applied to the average or typical weld.</p>	<p>AWS3 offers both data logging and on-screen SPC including run charts, histograms and analyses.</p>
	

DISPLAY

	Operating panel (OP-AWS3)	Touch screen panel (TP-AWS3)
Resolution	VGA (5,7", diagonal 14,5 cm)	VGA (8,5", diagonal 21 cm)
Interface	2nd TCP-IP (RJ45)	2nd TCP-IP (RJ45)
Operation	One push/turn button	Touch
Data storage	USB stick	USB stick
Dimensions WxHxD	228x144x78 mm (without holder)	292x198x75 mm (105 with adapter)

WELD HEADS

	MFP25	MFP60	MFP400	MFP800
Configuration	Servo motorised weld head with stand and quick-change electrode system; MFP-A versions are without a stand.			
Closing stroke	Servomotor-driven			
Welding pressure	Servomotor-driven			
Weld force max	1-25 N	25-60 N	60-400 N	100-800 N
Weld force adjustment	Via motor control unit			
Electrode shape	Locked or cylindrical, top and bottom MFP25: d = 4 mm; MFP60: d = 3 / 6 mm; MFP400: d = 6 mm; MFP800: d = 10 mm			
Electrode holder	Quick change holder with anti-rotation protection			
Max electrode stroke	25 mm		30 mm	25 mm
Secondary cables	2x50 mm ² 700 mm dep.on application	2x95 mm ² , 700 mm dep. on application	2x95 mm ² , 700 mm dep.on application	4x95 mm ² , 700 mm dep. on application
Environment temp.	0-40 °C			
Cooling	Option: water-cooled electrode holders		Water-cooled electrode holder	
Series weld head configuration	yes	yes	yes	yes

MOTOR CONTROL

	MNCx-Ax
Configuration hardware	Servo weld head control and weld pincer control w/remote control
Supply voltage	230 V +/- 10% (110 V optional)
Mains frequency	50-60 Hz
Protection class	IP20
Weld head control	Welding force, speed and positioning control: - One servo motorised weld head or pincer - Two servo motorised weld heads or pincers **) - One dual servo motorised weld head **) - One compacting unit - Two compacting units**)
Programmable and external weld schedules	99 at single axis; 49 per head at dual axis
Weld pulse control	Search time, squeeze time, hold time
Displacement accuracy	+/-0.01 mm/over the entire stroke of the welding head
Environment temp.	0-40 °C
Cooling	Air-cooled
**) second motor control required	

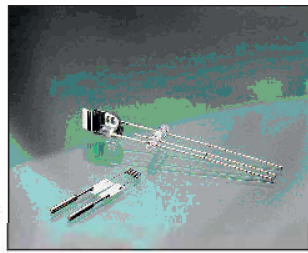
WEIGHT & DIMENSIONS

	MNCx-Ax	ISQ20-X
Weight	approx. 19 kg	ISQ20-3: approx. 33 kg ISQ20-6: approx. 43 kg ISQ20-8 and ISQ20-10: approx. 20 kg ISQ-20-20 approx. 21 kg
Dimensions (L x H x D)	216x420x480 mm; 482x133x380 mm (19" unit)	216x420x550 mm; 482x177x330 mm (19" unit)

TYPICAL APPLICATIONS



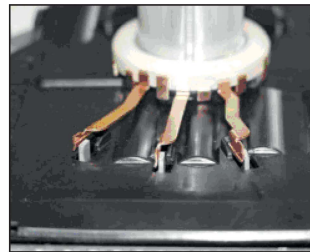
Electronics



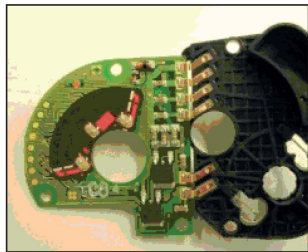
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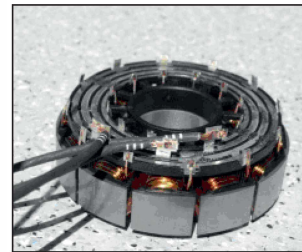
Medical engineering



Automotive



Automotive



Automotive