

# AWS3

## Pneumatic Active Welding System



### ACTIVE WELDING SYSTEM 3 PNEUMATIC

The Active Welding System is available as standard or with displacement and force measurement. It includes three main components, which are an operating panel, a welding control and a weld head such as F120 or a weld pincer such as FP1100-Z.

The AWS3 can control 1 or 2 weld heads or weld pincers depending on the configuration selected. An additional 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 AWS3 Active Welding System combines pneumatic weld heads / weld pincers (F- and FP-series) with an inverter power supply (ISQ-series) all in one unique system.

Its various interfaces make AWS3 an easy to integrate system for automation.

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.

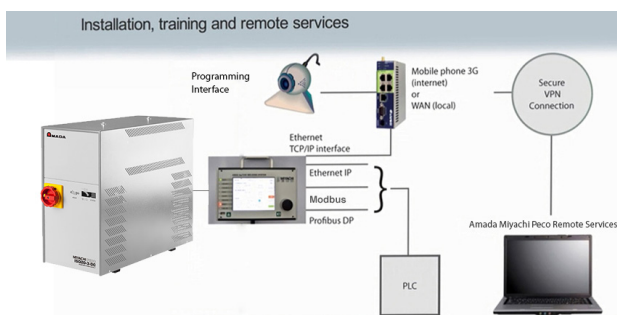
Integrated process control is ensured for all electrical and mechanical welding parameters i.e. for current, voltage, power time, force and distance.

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 TouchPanel).

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 Pneumatic Standard	AWS3 Pneumatic Displacement & Force
<b>Features</b>		
Graphical waveform	x	x
SPC	x	x
Process monitoring	static, dynamic	static, dynamic
Data logging	x	x
<b>Communication</b>		
Digital I/O	x	x
RS 232	x	x
Ethernet TCP/IP	x	x
Modbus TCP	x	x
Profibus or Ethernet IP	Optional	Optional
<b>Control</b>		
Two separate weld heads (figure 5)	x	x
Dual weld head series, step (figure 6)	x	x
Force control	x	x
Force monitoring		x
Displacement monitoring		x
<b>Hardware</b>		
Operating panel (figure 3 and 4)	Operating panel OP-AWS3 or Touch screen TP-AWS3	
Weld heads (figure 2)	F120, F160, FP200 or newhorizon™ pneumatic weld heads FP400, FP700, FP1100 pneumatic lower stroke units	
Weld pincers	F120-Z, F160-Z, FP200-Z or newhorizon™ pneumatic weld pincers FP400-Z, FP700-Z, FP1100-Z	
Compacting modules	C16, C25, C70	
Welding control DC (figure 1)	ISQ20-3, -6, -10 or -20	
Welding control AC (figure 1)	ISQ20-8	
Displacement sensor & force sensor	Use sensors that are specified for the corresponding weld head	



Figure 1: ISQ power supply



Figure 2: pneumatic weld head



Figure 3: operating panel OP-AWS3



Figure 4: touch screen panel TP-AWS3

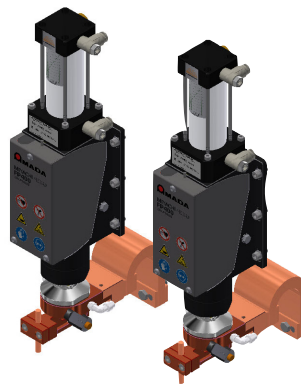


Figure 5: Two separate pneumatic weld heads

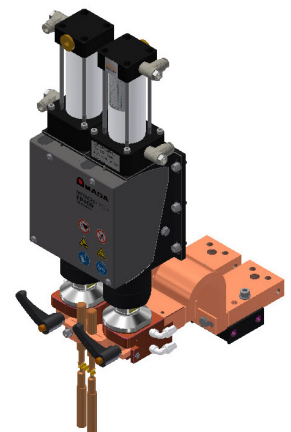
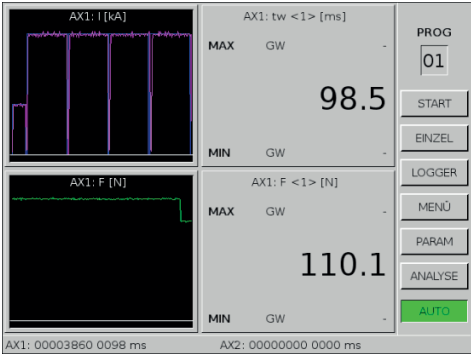
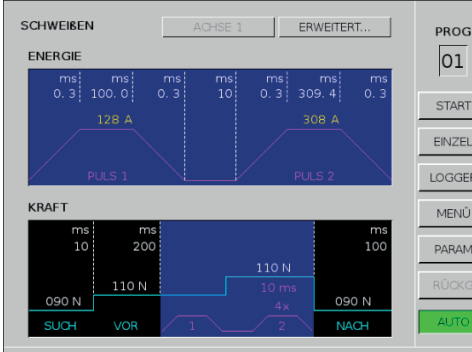
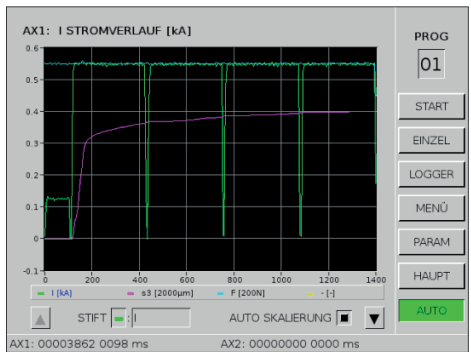
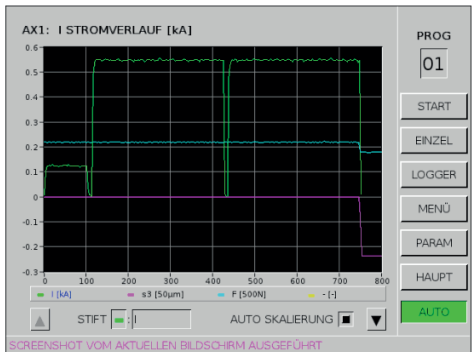
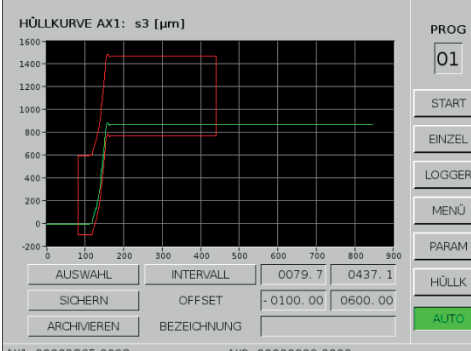
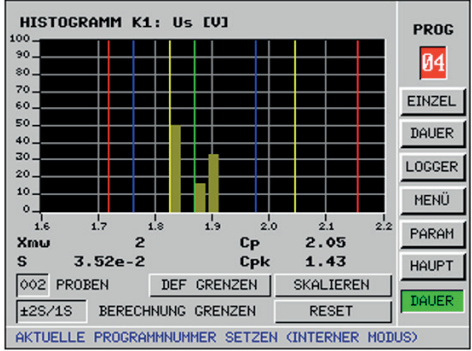


Figure 6: Dual pneumatic weld head

## 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. Optional interfaces are 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>
	

## TECHNICAL SPECIFICATIONS

General	ISQ20-3 and ISQ20-6	ISQ20-10 and ISQ20-20
Weld current type	Controlled DC inverter current	
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 3x 440 - 480 V	3 x 400 V 3x440 - 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	Displacement & Force only, 0-10 VDC input	
Displacement measurement	Displacement & Force only, displacement sensors w/varying resolutions and varying strokes	
Displacement measuring range / accuracy	Displacement & Force only, 0-12.5 mm/ +/- 2 µm with sensor µm	
Displacement measured value resolution	Displacement & Force only, according to sensor type 1 to 0,1 µm digital	
Operation	Toggle wheel, colour display, Optional: Profibus or Ethernet IP or optional touch screen	
Weld Head Control	Variable, squeeze, hold, and repeat times One or two pneumatic weld heads or pincers One dual pneumatic weld head One or two compacting units	
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	CD	
* 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		

## 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

The suggested items listed below can be used with the AWS3 pneumatic.

1 or 2 Weld Heads	1 or 2 Pincers	FD120	Compacting Units
F120	F120-Z	F120-D	C16 Series
F160	F160-Z	FP400-D newhorizon	C25 Series
FP200	FP200-Z	FP700-D newhorizon	C70 Series
FP400 newhorizon	FP400-Z newhorizon	FP1100-D newhorizon	
FP700 newhorizon	FP700-Z newhorizon		
FP1100 newhorizon	FP1100-Z newhorizon		

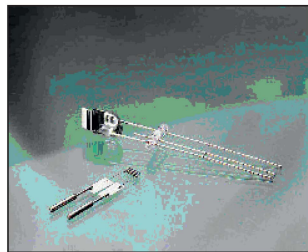
## WEIGHT & DIMENSIONS

	ISQ20-x
Weight	ISQ20-3: approx. 33 kg ISQ20-6: approx. 43 kg ISQ20-8 and ISQ20-10: approx. 20 kg ISQ20-20: approx. 21 kg
Dimensions (LxHxD)	216x420x550 mm 482x177x330 mm (19" unit)

## TYPICAL APPLICATIONS



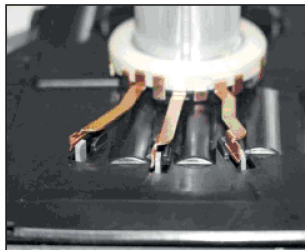
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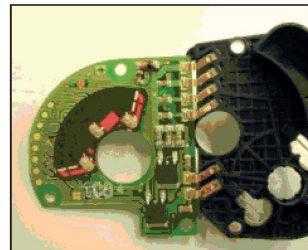
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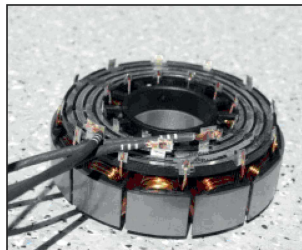
*Medical engineering*



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