

AWW MediCom station

Laser welding of plastics



AWW station equipped with 200 W / 980 nm laser
Laser is water cooled. Cooling unit with closed circuit is integrated inside station.



Detail of process head installed on motorized YZ unit.

■ Laser welding station AWW (Automatic Welding Workstation) is primary dedicated for laser welding of plastics. As a laser source is used semiconductor diode laser emitting on selected wavelength optimized for the specific application. Available are sources in power range from 30W up to 200W.

Laser radiation is guided to the process head using optical fibre. The process head is designed with fixed focus or optionally it is a scanning head with f-Theta lens. Diameter of focus spot is configurable and could have circle or elliptical form.

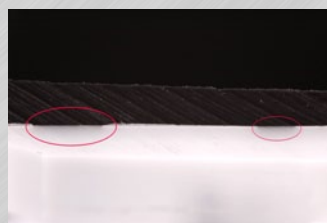
Process head is optionally equipped with laser power measurement device for operation in power regulation mode and/or contactless measurement of temperature in welding spot – temperature regulation mode. In temperature regulation mode is possible online monitoring of welding process, allowing detection of inhomogeneities, low quality of seams resulting by improper contact of welded parts etc.

Design of station is always individual in correspondence with application. Basic model is equipped with rotation axis and two controlled linear stages used for welding mainly cylindrical parts. Weld operation is possible in two modes - circumferential welds on cylindrical parts or vertically oriented linear seams.

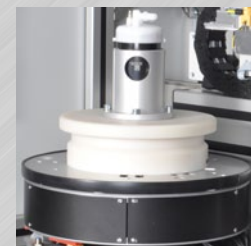
Alternative head design with scan mirror unit is suitable for applications requiring **quasi-simultaneous** welding mode. The joining surface is traversed several times per second and whole - typically closed contour - is simultaneously heated. Result is homogeneously welded part.

Part loading and unloading is manual. Part is placed in SMED type fixture. Part fixtures are automatically recognized by system. Every fixture is equipped with sensors, fixation and pressing devices to ensure proper part position and contact of joined surfaces.

Every part has unique program for up to 16 individual seams each with own set of process parameters (speed, power, temperature, profile, etc.). Operation is very intuitive and programming via touch panel can define a new part within minutes.



Cut of welded product.
Red signs show welded points.



Part inserted in fixture. Circumferential welding using part rotation.

Technical parameters of laser:

Laser		Process head	
Type:	semiconductor laser diode	Focal length:	180 mm (60-250 mm)
Wavelength:	808 nm (790 - 980 nm)*	Spot size:	2.3 mm (0.3 - 4.5 mm) fibre code diameter and focal length dependent
Power:	180 W (35, 50, 70, 100, 200 W)*	Focus spot geometries:	circle, elliptical*
Generation mode:	continuous (modulated)	Process control:	power monitoring* measurement of temperature in welding spot*
Laser cooling unit power > 60W		Process head with scan mirrors unit*	
power < 70W		Principle:	galvanometric deflection of beam in X and Y axis
Optical fibre Diameter:		Type:	fast scanning mirrors
Length:		Speed:	0 - 4000 mm/s
		Resolution:	2 µm
		Repeatable accuracy:	25 µm
		Focal distance:	150 mm (100-300 mm)

Technical parameters of AWW station:

System control		Drives	
PLC:	PLC Simatic S7-300 monitors and adjusts all laser process parameters	Type:	servo motors
Connection:	MPI, Profibus DP	Control unit:	controller MoconDP controlled via Profibus
Software and HMI Operator's panel:		Stroke Y, Z:	300 mm
Programmable parameters:		Other parameters (basic model)	
		Power supply:	230 V, 50 Hz
		Input:	1800 W
		Pressed air:	> 6 bar
		Protection:	IP44
		Dimensions:	1200x2000x800 mm [wxhxd]
		Weight:	480 kg
		Operating conditions:	temperature 15°C – 33°C, non-condensing humidity

Selected accessories*:

Additional units		Remote control	
Print:	unit for printing pieces by coloured mark - sign of successful welding process	HW:	modem for remote control via internet
Nonconforming parts warehouse:	nonconforming parts warehouse with detection of insertion	Interface:	Ethernet, RJ45
Fixtures warehouse:	warehouse for loading fixtures	Exhaust system	
		Exhauster Type1:	180 m³/h, power regulation 230 V, 1.3 kW

* alternative or optional selection

