

# Sensor-Workstation AL-SWS

## ONE LASER SYSTEM – SEVERAL APPLICATIONS

### *The multifunctional laser workstation with changeable inserts*

With the AL-SWS multifunctional laser system, you can effortlessly weld and cut work pieces with a diameter of up to 12 mm; for example, sensors, sheathed or unsheathed cables, sheathed or unsheathed thermocouples or resistance thermometers.

The variable inserts for the special tasks of sensor manufacturing can be replaced very easily. This allows you to quickly switch between the different welding and cutting applications.

### Options

- Smoke exhaustion
- Ergo wedge for setting the individual viewing height for an ergonomic working position
- Camera system for displaying the working process on an external monitor
- Turn and tilt objective for flexible working, even in difficult working positions
- Cross hair-synchro adapter for synchronizing the cross-hair during work outside of the welding spot
- Cross-hair generator for superimposing a cross-hair on an external monitor
- Other inserts on request



## Technical Data

EXTERNAL DIMENSIONS	
Workbench (L × W × H)	130 cm × 75 cm × 92 cm
Required space (L × W × H)	130 cm × 150 cm × 150 cm
Weight	Approx. 320 kg
ELECTRICAL CONNECTIONS	
3-phase	3 × 400 V, 50-60 Hz, 3 × 16 A N/PE
LASER	
Laser crystal	Nd:YAG, flash lamp-pumped
Wave length	1064 nm (invisible, near infrared)
Laser protection class	4 (1 in case of insert with a working chamber)
Average power	50 W–300 W
Pulse Energy	50–90 Joule
Peak pulse power	5–9 kW
Pulse duration	0,5 ms–20 ms
Pulse frequency	0-100 Hz
WELDING / CUTTING	
Focal spot Ø	0,2-2,0 mm With Micro Welding : 50 µm-2,0 mm
Observation objective	Stereo Microscope attachment Eyepiece 10×, 16×, 25×/ Visual field Ø 3-16 mm
Focal distance	90 mm, 120 mm oder 150 mm
Shielding Gas input	Included
MOVEMENT SYSTEM	
Machine axes	4 (2× software-controlled, 2× manual)
Range of movement	Y: approx. 40 mm, Z: approx. 120 mm

## Components of the Laser System

- Work bench with lighting, shielding gas input, exhaust tube
- One or more variable inserts
- Integrated AL laser device (50-300 W)
- Laser power supply with laser control unit and integrated water-to-air cooling
- Laser resonator with a welding or cutting head (depending on the insert)
- Leica observation objective
- NC controlling via touch screen
- Footswitch, laser safety system
- USB connection for data backup
- Process data handling



## Insert A - Contact Welding

During the welding process, the two parts to be welded are held manually under the laser beam, for example, for welding (sheated) cables or thermocouples.

The insert consists of:

- Recess for feeding through longer work pieces from below, e.g. cables with insulated sheath
- Exhaustion tube
- Two grips for quickly changing the insert



Contact welding

## Insert B - Circular Welding

The integrated rotatis axis rotates the work pieces during the welding: for example, for welding the sheath of resistance thermometers, sensors, or thermocouples.

The insert consists of:

- Rotary axis, pivotable and slidable, with three-jaw chuck  $\varnothing$  63 mm, opening for work piece: up to  $\varnothing$  8 mm
- Quick positioning/fine adjustment
- Buttons for starting/stopping the welding process
- Pneumatic collet chuck, exhaustion tube
- Recess for feeding through longer work pieces from below, e.g. cables with insulated sheath
- Niches for stowing smaller tools
- Two grips for quickly changing the insert



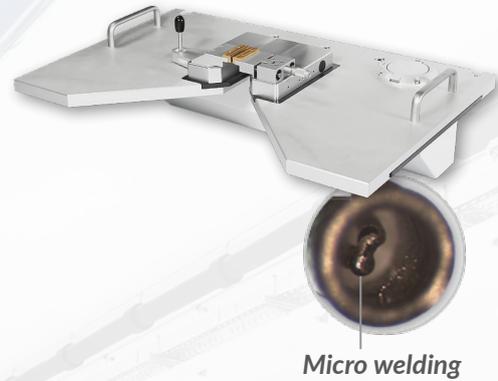
Circular welding

## Insert C - Micro Welding

With this insert you can weld even inside the finest thermocouples.

The inserts consists of:

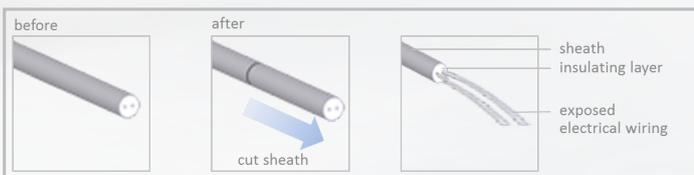
- A micromanipulator for precise positioning
- Exhaustion tube
- Two grips for quickly changing the insert



## Insert D - Cutting

This insert is used to cut rotationally symmetrical work pieces. The work piece is rotated and cut down to a specified depth around its entire circumference.

For example, you can use this insert to cut the covers of resistance thermometers. This insert is also ideal for removing the sheath of sheathed cables:



The insert consists of:

- Closed working chamber with collet chuck, rotating axis and exhaustion tube
- Reference mark (optional) for processing multiple work pieces of the same length (up to 2 m length)
- Buttons for opening and closing the collet chuck and reference mark
- Two grips for quickly changing the insert
- Laser cutting head

## Insert E - Sheath Welding Under Mechanical Pressure

Use this insert to weld two parts of a sensor housing together. Both parts are mechanically pressed against each other, to press the internal sealing rings:



*Sheath welding*

The insert consists of:

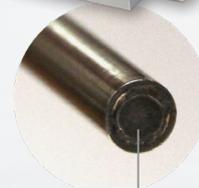
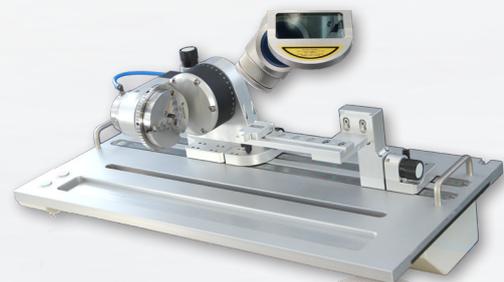
- Closed working chamber
- Collet chuck, tailstock
- Exhaustion tube

## Insert F - Circular Welding with Horizontal Guide

This insert is designed specifically for end and face weldings on long work pieces.

The insert consists of:

- Same components as insert A, but with three-jaw chuck  $\varnothing$  100 mm, opening for work piece: up to  $\varnothing$  15 mm
- + Slidable horizontal guiding rails
- + Turn and tilt objective (optional)



*Face welding*