

DATA SHEET:

LASER WELDER IN HIGH VACUUM

Product features:

- High vacuum lasers: innovative welding technology with clear advantages versus electron beam and vacuum welders
- Welding process without protective gas suitable for reactive metals (titanium ...)
- Highest process stability due to high vacuum (no plasma torch)
- Smallest component contamination from spills and evaporation
- High quality and non-porous welds
- High flexibility in the size of the vacuum chamber
- Low operating costs compared to electron beam
- Flexible application of almost all laser types (NdYAK, diode laser etc.)
- System allows all geometries through 6-axis technology
- Most flexible and easy exchange of welding devices
- Rotary tables of various designs can be used
- The modular design also allows the subsequent adaptation to new workpieces and changed production
- CNC control with process-specific and intuitive operator masks
- Up to max. 6 laser heads can be installed, which significantly increases flexibility
- No demagnetization process necessary
- Welding process is optically verifiable during the process
- No X-ray protection necessary
- No shielding of power cables necessary

Specifications: VALSA RU-1 (Example)

Chamber:

Diameter	1,000 mm
Length	1,800 mm
Total length	4,000 mm
Pumping station	3-stage (rotary vane, Roots and turbo pump)
Cooling unit	1KW cooling capacity
Vacuum	Up to 1×10^{-5} mbar
Evacuation time	approx. 20 min. at 1×10^{-4} mbar (depending on chamber size)

Max. Workpiece sizes:

Length	1,200 mm
Diameter	600 mm
Revolver	up to 24 parts

Laserstrand:

Solid state laser	Nd-Yag laser
Beam guidance	via laser light cable
Optic	lens and mirror optics
Laser head adapter	15 pieces, in 3 rows
Focus length	300 mm and 500 mm, exchangeable
Focus adjustment	via 3D table

Control System:

CNC	Mach3, 6-axis, X-Y-Z positioning axes, A-B-C free axes for devices
Engines	3 stepper engines, accuracy 0.01mm in XYZ

Dimensions without laser:

Depth x width x height	up to max. 4,000 x 1,500 x 1,700 mm
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Power requirements without laser:

Voltage	up to approx. 3 x 400V, PE, N, 50 Hz
Power	up to approx. 10 kVA without laser

Data sheet Laser welder in high vacuum

Trumpf Trupulse 103 special equipment (Example)

Laser:

Average power	90 watts
Spot diameter	at 300 mm focal length 1mm
Light guide	3 pcs. with beam deflection and camera,
Pulse power	8 KW
Pulse energy	90 J
Pulse duration	0.3-50 ms,
Wavelength	1064 µm
Safety	laser protection class 1 (without chamber)

Cooling:

Water heat exchanger	water - air integrated in the device
Ambient temperature	10-35 ° C

Optical fiber:

Fiber conductor	3 pieces, a 10 meters, 300 µm core diameter
Security monitoring	Central security lock for optical fibers
Position detection	via pilot laser

Size:

(W x H x D)	980mm x 1220mm x 505mm
Weight	300 kg

Electrical connection:

Wide range	380V-10% to 460V + 10% 3P + PE, 50-60Hz, 16A
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Total price:	500,000.00 € included chamber, pump, laser without devices
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Devices:

Turret turning device 2 axes endless	45.000.00 €
Shaft turning device 1 axle, 1m	11,000.00 €
Swivel table 2 axles	12.000.00 €
Turntable 1 axis 360 ° endless	4.000.00 €

