UNIMACH

2025

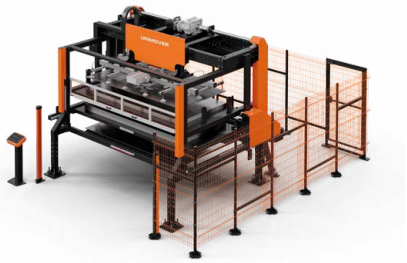
Laser metal processing equipment

unimach.ru

Content

Unimach® laser cutting machines can be optionally equipped with a module for cutting tubes providing an effective solution for precision cutting of round and rectangular tubes.

Automation system UNIMOVER ensures automatic loading/unloading of sheet metal without interruption of machine operation work and saves time of working shift preparation.



Pneumatic loader UNIARM ensures more convenient loading of sheet metal and makes working processes quick, simple and safe.

Automatic high-precision laser welding of metal parts with the help of a robotic manipulator. High performance, precise weld, processing complex shapes, high positioning precision.

LaserWeld ensures high-speed and accurate welding of workpieces with various shapes and material and features low maintenance costs.

Air filtration unit AFU-8 filters air from dust, solid particles and smoke during welding, soldering, thermal cutting of metals and other production operations. AFU-8 provides a solution for polluted air at the production area and can be used as a part of technological process.

About

NPK Morsvyazavtomatica LLC (NPK MCA) is a diverse manufacturing of company that delivers industrial, power and marine equipment. Founded in 2003, our company has been growing continuously and steadily for more than 20 years focusing on the innovative approach and customer care.

Along with the manufacturing unit, NPK MCA has at its disposal research and design departments. This enables to implement innovations; therefore, reduce costs, improve quality, expand the product range and increase the production output.

Along with the design and manufacturing of the equipment, NPK MCA provides commissioning works, personnel training, warranty and post-warranty service. Our skilled professionals carefully analyze customer needs and offer the best customized solutions.

Wide expertise paired with streamlined business processes enable the company to complete any project successfully.

MCA | Our business areas

2003

Shipborne electronics

Marine intercom systems
Monitors, computers, panel PCs
Peripheral equipment

2005

General–purpose metalworking

Navigation control consoles and work-stations

2008

Machine tool building

Laser and plasma cutting systems

2011

Construction

Industrial projects

2015

Propulsion systems

Thruster and steering column control systems
Frequency converters for electric propulsion

2016

Climate control equipment

Shipborne air conditioners and chillers

2018

Energy storage systems

High energy Li-ion and highly resourceful LTO battery modules and systems

2019

Electric vessels

Noiseless sustainable electric vessels for cruises and passenger transportation

2020

Laser systems

Laser welding

2021

Autonomous power generation

Diesel generators and gas powered generators
Power distribution equipment
Automation cabinets

2022

Additive equipment

Design and manufacture of 3D printers for large objects

2023

Interior solutions

Design and manufacture of composite materials

2024

New models of laser cutting

2025

Heavy-duty gantry milling machine

UNIMACH

Laser metal processing equipment

Up-to-date metal processing companies need reliable solutions for continuous and efficient work. Our mission is to manufacture high performance equipment and provide services for its continuous work.

Our company is constantly in touch with our customers and, therefore, we know well their demands and requirements. This approach enables to enhance functionality of the machines, make them suitable and even exceed the customer needs.

We design equipment and software, manufacture components, our employees assemble and set up the machines. Wide expertise and successful manufacturing enable us to guarantee high quality of the equipment and service, from the first order to post-warranty service.

We take customer care as a duty without any limitations. We are ready to provide spare parts and consumables for any equipment by brand Unimach® not depending on the date of manufacturing, whether it was yesterday or 15 years ago.

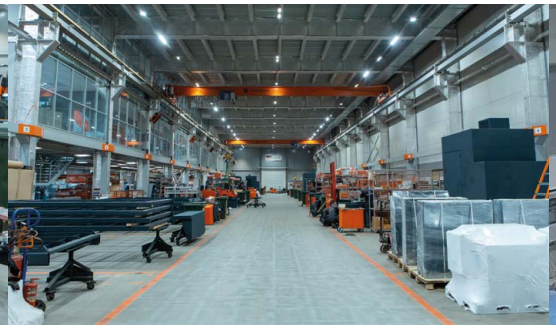
Our production:

- Laser cutting machines for flat products (sheet and coil metal).
- Laser cutting machines for tubes and profile iron.
- Automatic metal loading/unloading units
- Laser welding machines.
- Press brakes.
- Air filtration units.
- Special-purpose software.
- Spare parts and consumables.

Our customers

More than a thousand and five hundred units of equipment (not including components) have been manufactured under Unimach® brand so far. We have more than a thousand customers including:

- PAO Severstal
- Surgutneftegas PJSC
- FGUP EMZ Rosselkhozakademii
- JSC "SMC "VIGSTAR"
- JSC Electrovipryamitel
- Niiem OAO
- JSC "Kazan Giproniiaviaprom" and others


UNIMACH LC ULTRA

Utmost performance
Operational excellence

Ultra series of laser cutting machines outstands Unimach® production line due to the utmost performance. Ultimate power of the linear drives paired with high-end digital data bus and electronics allows for reaching unprecedented acceleration and deceleration of free movements resulting in extreme efficiency at cutting complicated high precision contours.

Laser cutting head UNIMACH LH-201 p. 34

Focal length control system FoCut p. 37

Linear drive up to 330 m/min p. 32

Machine vision system UniVision p. 44

Side collision protection system p. 41

Simple integration into manufacturing

UNICUT software p. 38

Automatic measurement of sheet size and position on the working table

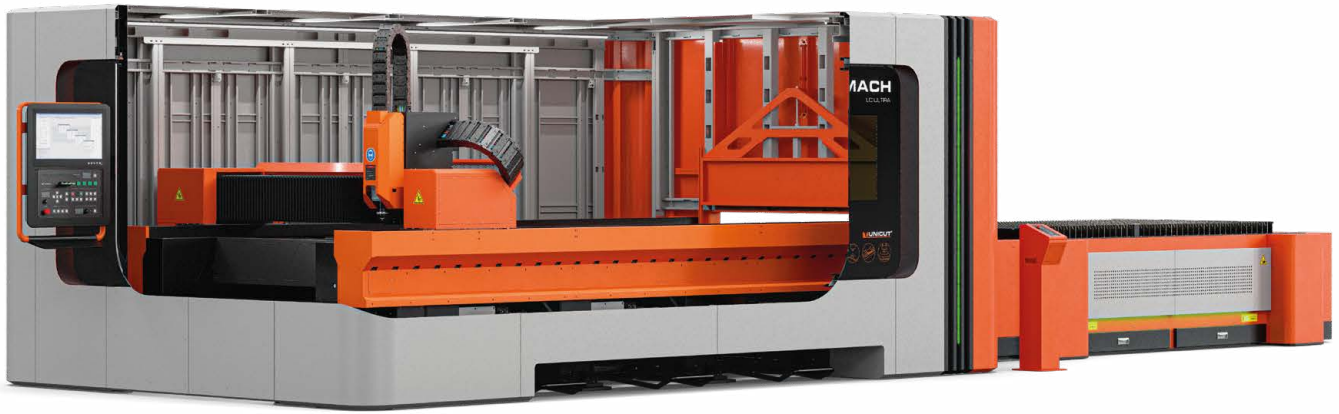
2 years machine warranty 3 years laser warranty

Standard equipment includes

- Rigid all-welded heat-treated machine bed with subsequent machining
- Gantry coordinate system
- Light-weight composite portal
- High precision guides with integrated feedback
- Linear drive
- Smoke exhaust system with automatic switching of zones
- Ytterbium fiber laser VPG Laserone
- Water / air cooling system (chiller)
- Focal length control system FoCut
- Laser optical head with automatic lens drive LH-201
- Control console UM-103 (IP65, industrial LCD 21", stationary control panel, pull-out keyboard)
- UniCut software
- 4-gas automatic console (2 gases up to 10 atm., 2 gases up to 20 atm.)
- Protective enclosure of cutting area with an access to the working table
- Automatic shuttle table
- Remote control panel
- Exhaust fan in a silencer
- SPTA kit
- Commissioning works and personnel training

Options

- Air filtration unit AFU-8
- Conveyor line
- Automated loading/unloading unit
- Compressor
- Laser protective barrier
- Barcode scanner



Model	Laser	Power (kW)	Overall dimensions, incl. shuttle table and CNC (L×W×H, mm)	Max. weight (kg)
UNIMACH LC ULTRA	Ytterbium fiber laser VPG Laserone	Up to 60	10150×3695×2610	15500

Max. speed (m/min)	330
Max. acceleration	5.5 g
Positioning accuracy*(mm)	±0.03

* 1 m measurement

UNIMACH LC PROFESSIONAL M3

Performance
Functionality
Reliability

Laser cutting machines UNIMACH LC PROFESSIONAL M3 series based on gantry coordinate system is a high-performance solution for Small & Medium Enterprise.

Laser cutting head UNIMACH LH-201 p. 34

Focal length control system FoCut p. 37

Linear drive up to 250 m/min p. 37

Machine vision system UniVision p. 44

Side collision protection system p. 41

Simple integration into manufacturing

UNICUT software p. 38

Automatic measurement of sheet size and position on the working table

2 years machine warranty 3 years laser warranty

Max. thickness:

- Carbon steel up to 80 mm
- Aluminum up to 100 mm
- Stainless steel up to 100 mm

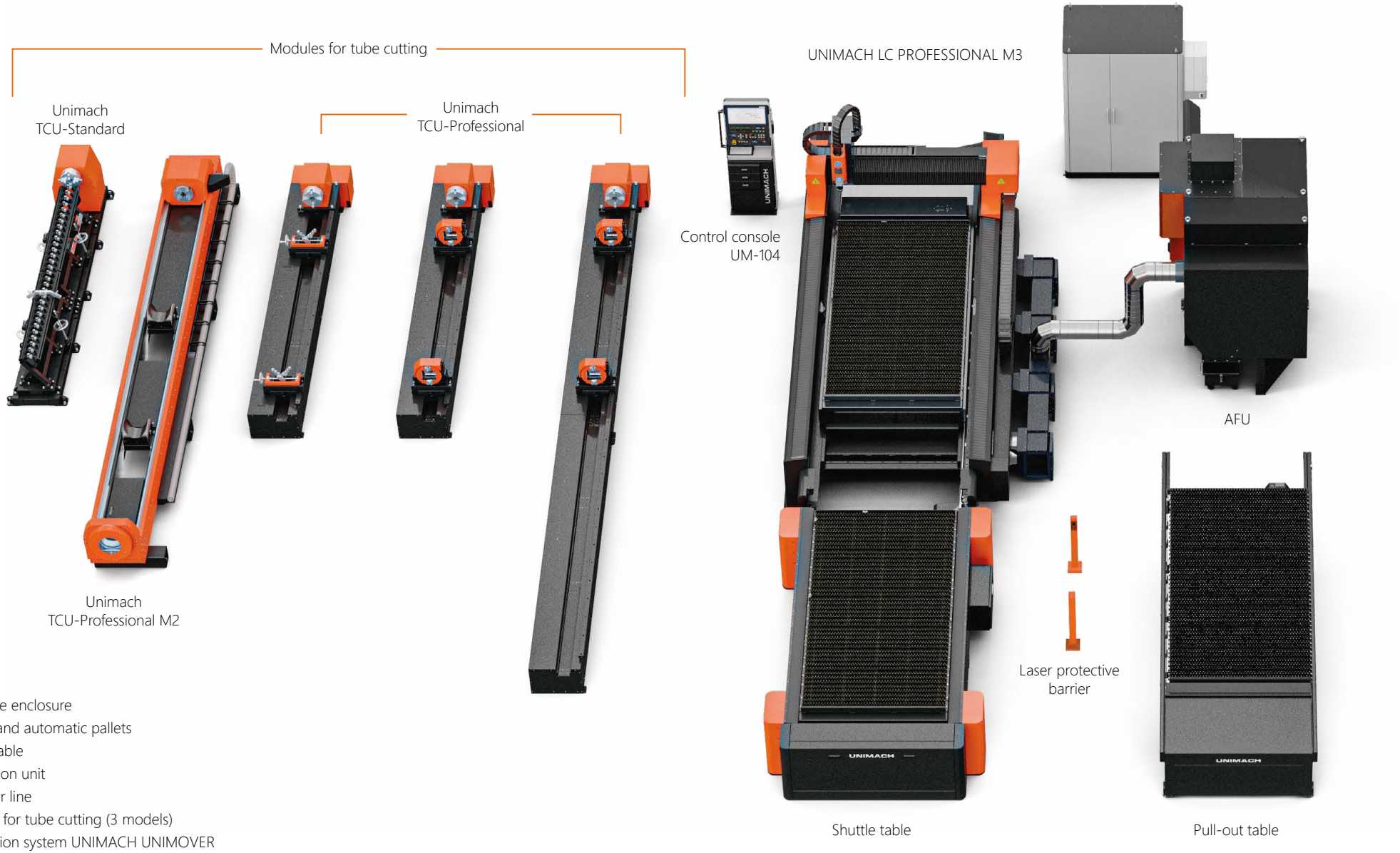
Model	Laser	Power (kW)	Overall dimensions (L×W×H, mm)	Max. weight (kg)
UNIMACH LC 3015 PRF M3	Ytterbium fiber laser VPG Laserone	Up to 40	10600×2795×2370	13500
UNIMACH LC 6020 PRF M3	Ytterbium fiber laser VPG Laserone	Up to 40	18000×4500×2700	20000

■ Working area 6050×2050 mm is available on request

Max. speed (m/min)	250
Max. acceleration	4 g
Positioning accuracy*(mm)	±0.03

* 1 m measurement

AUTOMATION AND FUNCTIONALITY



- Protective enclosure
- Manual and automatic pallets
- Shuttle table
- Air filtration unit
- Conveyor line
- Modules for tube cutting (3 models)
- Automation system UNIMACH UNIMOVER
- Pneumatic manipulator UNIMACH UNIARM
- Decoiler
- Laser protective barrier

Automation system UNIMACH UNIMOVER

Pneumatic loader UNIMACH UNIARM

Protective enclosure of cutting area

Decoiler

Wide range of additional modules

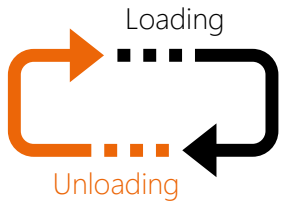
Standard equipment includes

- Rigid all-welded heat-treated machine bed with subsequent machining
- Gantry coordinate system
- Light-weight composite portal
- High precision linear guides with integrated feedback
- Linear drive
- Smoke exhaust system with automatic switching of zones
- Ytterbium fiber laser VPG Laserone
- Water / air cooling system (chiller)
- Focal length control system FoCut
- Laser optical head with automatic lens drive LH-201
- Control console UM-104 (IP65, industrial LCD 21", stationary control panel, pull-out keyboard)
- UniCut software
- Automatic pull-out table
- Three-channel gas control system
- Remote control panel
- Exhaust fan
- SPTA kit
- Commissioning works and personnel training

Save time with dual-pallet system for metal sheet loading/unloading

Shuttle table with dual-pallet system ensures metal sheet loading to the cutting area, reduces loading/unloading time and provides non-stop operation.

Pallets are alternately moved to the cutting area: while metal is being processed on the first pallet, ready details are unloaded from the second pallet and a new sheet is loaded.



Pull-out pallet

Sheet loading is carried out using an automatic pull-out pallet. The pallet can be moved out of the cutting area providing convenient and safe loading and preventing the machine from possible damage.

LC MASTER DIRECT

New series UNIMACH LC MASTER DIRECT combines high-speed and dynamic linear drive, fast-acting internal digital network, state-of-the-art electronics and unparalleled price.

Another advantage of UNIMACH LC MASTER DIRECT is a wide range of automated units and devices such as shuttle (dual-pallet) systems and tube rotators.

Laser cutting head UNIMACH LH-201 p. 34

Focal length control system FoCut p. 37

Linear drive up to 160 m/min p. 37

Machine vision system UniVision p. 44

Side collision protection system p. 41

Simple integration into manufacturing

UNICUT software p. 38

Automatic measurement of sheet size and position on the working table

2 years machine warranty 3 years laser warranty

High dynamics and affordable pricing

Options

- Automatic pallets
- Automatic shuttle tables
- Protective enclosure
- Integrated tube rotators
- Air filtration unit AFU-8
- Extended SPTA kit
- Laser protective barrier

Standard equipment includes

- Rigid all-welded heat-treated machine bed with subsequent machining
- Gantry coordinate system
- Light-weight composite portal
- High precision linear guides
- Linear drive with a precision measuring scale
- Zoned smoke exhaust system
- Ytterbium fiber laser VPG Laserone
- Water / air cooling system (chiller)
- Focal length control system FoCut
- Laser optical head with automatic lens drive LH-201
- Control console UM-102
- UniCut software
- Three-channel gas control system
- Remote control panel
- Exhaust fan
- SPTA kit
- Commissioning and personnel training

Max. thickness:

- Carbon steel up to 40 mm
- Aluminum up to 40 mm
- Stainless steel up to 40 mm

Model	Laser	Power (kW)	Overall dimensions (L×W×H, mm)	Max. weight (kg)
UNIMACH LC MASTER DIRECT FO3015	Ytterbium fiber laser VPG Laserone	Up to 12	5010×2635×2230	5900
UNIMACH LC MASTER DIRECT FO6020	Ytterbium fiber laser VPG Laserone	Up to 12	8620×3065×2230	10000

Max. speed (m/min)	160
Max. acceleration	2.6 g
Positioning accuracy *(mm)	±0.03

* 1 m measurement

LC MASTER SERVO

Laser cutting machines UNIMACH LC MASTER SERVO series is an efficient solution for micro and small enterprise. This series comes to the aid when a customer needs high quality equipment, but application of expensive linear drives is impractical.

Ytterbium fiber lasers VPG Laserone installed on the equipment of UNIMACH LC MASTER SERVO series provide high efficiency and a great solution for a wide variety of tasks.

Laser cutting head UNIMACH LH-201 p. 34

Focal length control system FoCut p. 37

Machine vision system UniVision p. 44

Side collision protection system p. 41

Simple integration into manufacturing

UNICUT software p. 38

Automatic measurement of sheet size and position on the working table

2 years machine warranty 3 years laser warranty

Standard equipment includes

- Rigid all-welded heat-treated machine bed with subsequent machining
- Gantry coordinate system
- Light-weight composite portal
- High precision linear guides
- Servodrive with anti-backlash gear, precision rack pinion
- Zoned smoke exhaust system
- Ytterbium fiber laser VPG Laserone
- Water / air cooling system (chiller)
- Focal length control system FoCut
- Laser optical head with automatic lens drive LH-201
- Control console UM-102 (IP65, industrial LCD 21", stationary control panel, pull-out keyboard)
- UniCut software
- Three-channel gas control console
- Remote control panel
- Exhaust fan
- SPTA kit
- Commissioning works and personnel training

Options

- Automatic pallets
- Automatic shuttle tables
- Integrated tube rotators
- Protective enclosure
- Air filtering unit AFU-8
- Extended SPTA kit
- Laser protective barrier

Max. thickness:

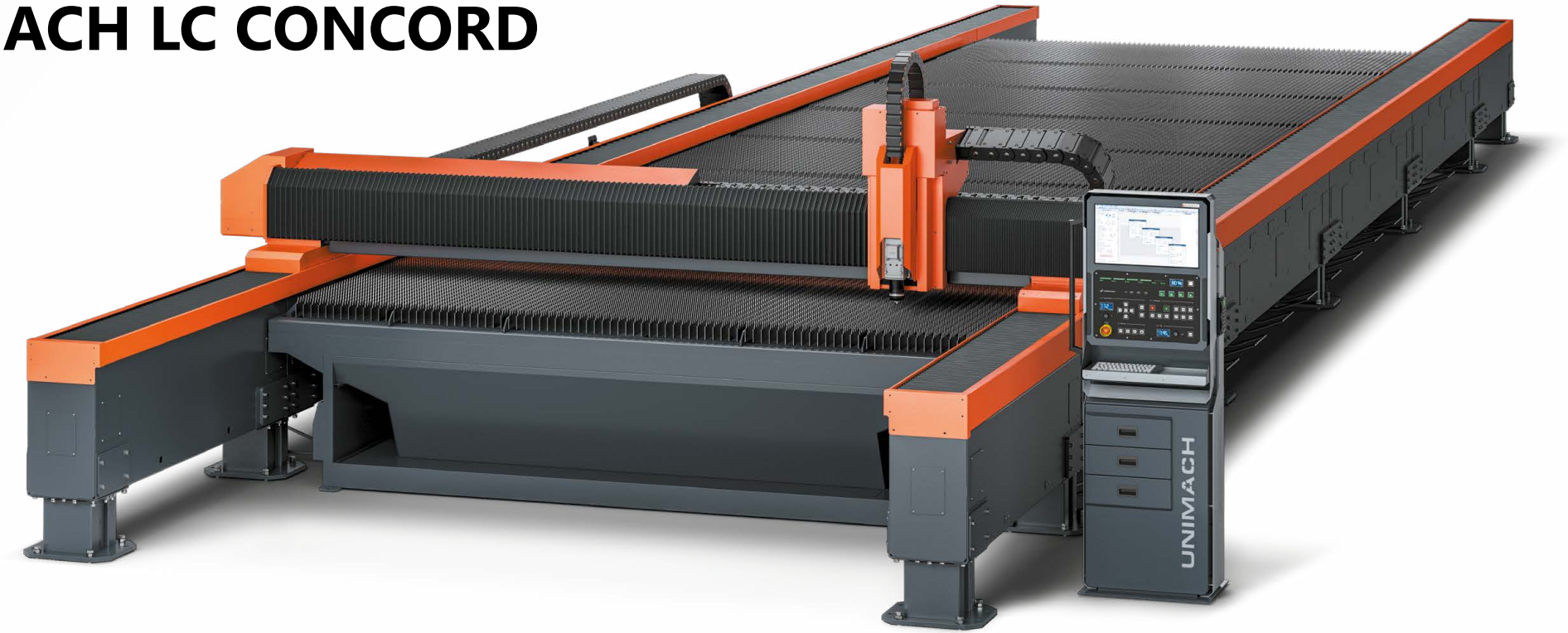
- Carbon steel up to 40 mm
- Aluminum up to 40 mm
- Stainless steel up to 40 mm

Model	Laser	Power (kW)	Overall dimensions (L×W×H, mm)	Max. weight (kg)
UNIMACH LC MASTER SERVO FO3015	Ytterbium fiber laser VPG Laserone	Up to 12	5010×2635×2230	5900
UNIMACH LC MASTER SERVO FO6020	Ytterbium fiber laser VPG Laserone	Up to 12	8620×3065×2230	10000

Max. speed (m/min)	130
Max. acceleration	2.2 g
Positioning accuracy *(mm)	±0.05

* 1 m measurement

UNIMACH LC CONCORD

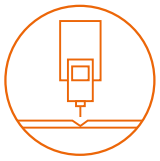


New laser cutting machine UNIMACH LC CONCORD is designed for cutting workpieces with length up to 40 m. A rotary laser head may be optionally installed to perform sheet cutting in five axis.

UNIMACH LC CONCORD can be successfully applied in shipbuilding, aircraft industry, car manufacturing and other areas.

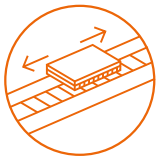
Standard equipment includes

- Reinforced modular milled machine bed
- Gantry coordinate system
- Reinforced composite portal
- High precision linear drives
- Zoned smoke exhaust system with automatic zone switching
- Ytterbium fiber laser VPG Laserone
- Water / air cooling system (chiller)
- Laser optical head LH-201
- Control console
- UniCut software
- Remote control panel
- Exhaust fan in a silencer
- SPTA kit
- Commissioning works and personnel training.



Laser cutting head UNIMACH LH-201 p. 34

Focal length control system FoCut p. 37



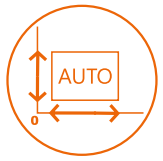
Linear drive up to 170 m/min p. 37

Machine vision system UniVision p. 44

Side collision protection system p. 41

Simple integration into manufacturing

UNICUT software p. 38



Automatic measurement of sheet size and position on the working table

2 years machine warranty 3 years laser warranty

Working area sizes at option:

length, mm: 12000, 24000, 36000, 40000;
width, mm: 2400, 2500, 2600, 2800, 3500.

Max. thickness:

- Carbon steel up to 120 mm
- Aluminum up to 100 mm
- Stainless steel up to 150 mm

Model	Laser	Power (kW)	Working area	Overall dimensions (L×W×H, mm)	Max. weight (kg)
UNIMACH LC CONCORD	Ytterbium fiber laser VPG Laserone	6-60	12000×3500	17762 × 5165 × 1938	19612

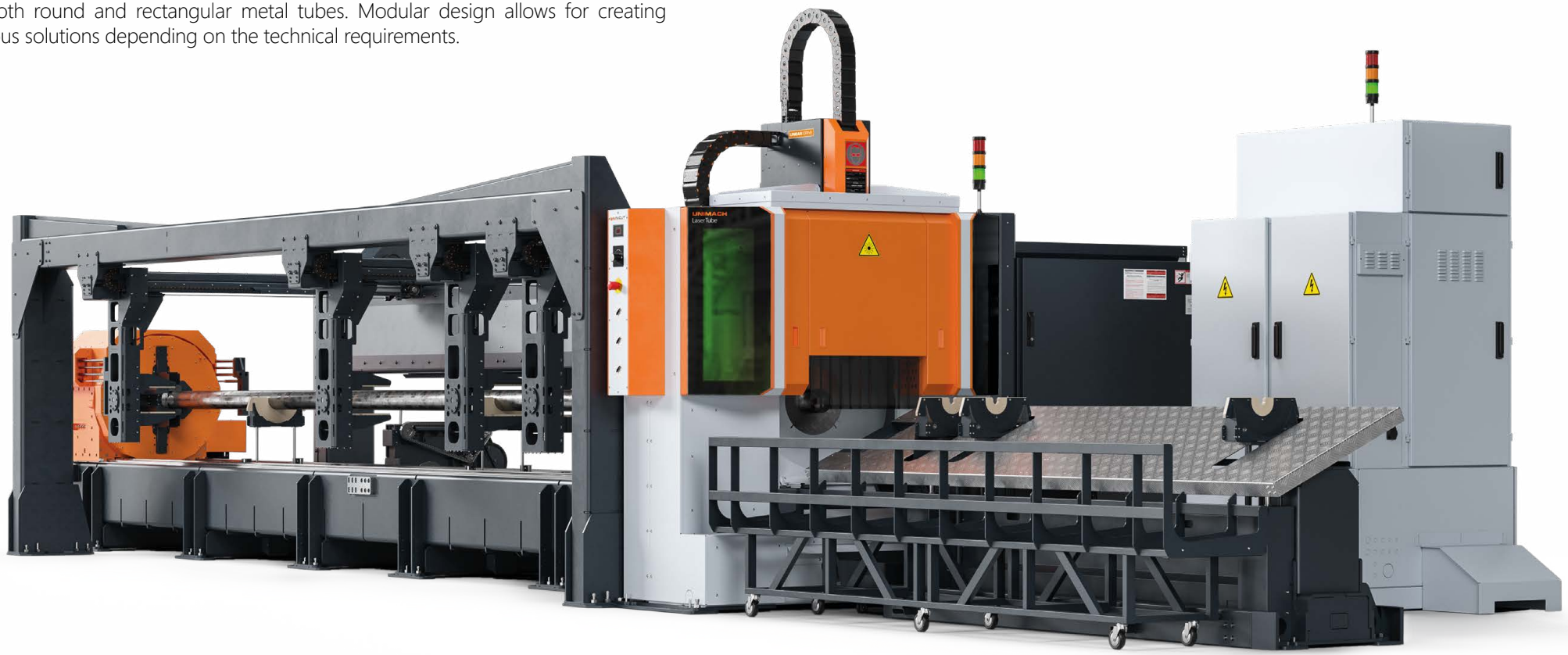
Max. speed (m/min)	170
Max. acceleration	1.2 g
Positioning accuracy *(mm)	±0.05

* 1 m measurement

Laser cutting tube machine

UNIMACH LASERTUBE AUTO

Laser cutting machine for shaped tubes LaserTube ensures high precision cutting of both round and rectangular metal tubes. Modular design allows for creating various solutions depending on the technical requirements.



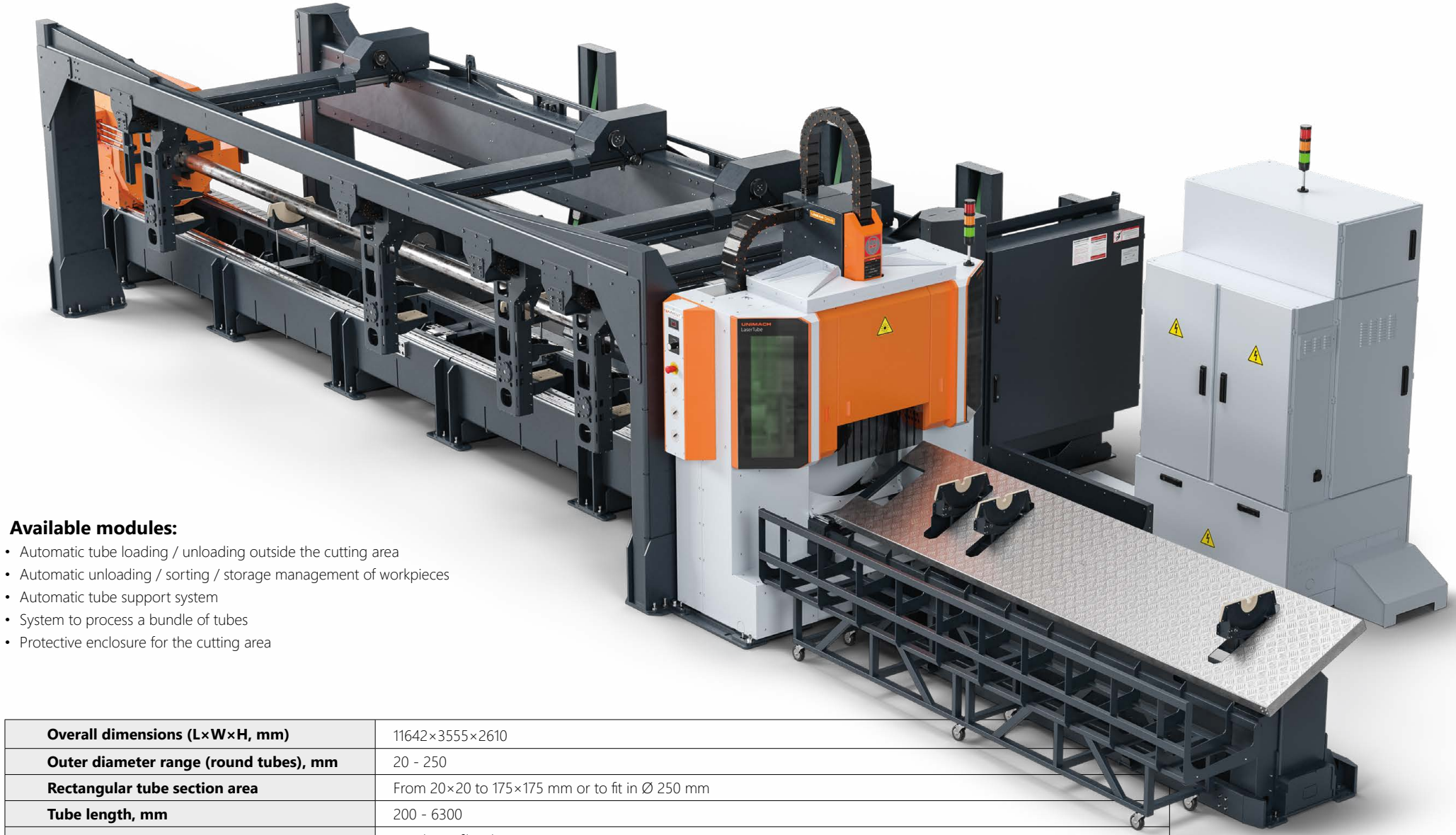
Laser cutting head UNIMACH LH-201
p. 34

Side collision protection system
p. 41

Simple integration into manufacturing

UNICUT software
p. 38

2 years machine warranty
3 years laser warranty



Available modules:

- Automatic tube loading / unloading outside the cutting area
- Automatic unloading / sorting / storage management of workpieces
- Automatic tube support system
- System to process a bundle of tubes
- Protective enclosure for the cutting area

Overall dimensions (L×W×H, mm)	11642×3555×2610
Outer diameter range (round tubes), mm	20 - 250
Rectangular tube section area	From 20×20 to 175×175 mm or to fit in Ø 250 mm
Tube length, mm	200 - 6300
Laser	Ytterbium fiber laser
Max. power consumption	14.6 kW
Power supply	~ 380 V
Axis X	Servo drive with anti-backlash gear, precision rack pinion
Axis Y	Linear drive with precision measuring scale
Axis Z	Servo drive with anti-backlash gear, additional tracking feedback, precision ball screw
Axis R	Linear drive with precision measuring scale

Laser cutting tube machine
UNIMACH LASERTUBE

Affordable, high-performance and efficient solution for Small&Medium Enterprise. The machine perfectly fits production facilities of medium capacity that do not require automatic loading units and tube moving to cutting zone.

Universal easy-adjustable supports along the movement of the chuck ensure reliable tube clamping and prevent it from distortion.

Laser cutting head
UNIMACH LH-201
p. 34

Side collision
protection system
p. 41

Simple integration
into manufacturing

UNICUT
software
p. 38

2 years
machine warranty
3 years
laser warranty

Features:

- Increased cutting precision in the clamping zone
- Automated drive of chuck and steady rest cams
- Linear drive of chuck with through-holes ensures precision tube rotation and high quality cutting
- Cutting tubes up to 6 meters
- Universal easy-adjustable supports save time while readjusting the machine
- Gas extraction system to remove dust and pollutant gases

Overall dimensions (L×W×H, mm)	10700×1800×5600
Outer diameter range (round tubes), mm	20 - 250
Rectangular tube section area	From 20×20 to 175×175 or to fit in Ø 250 mm
Tube length, mm	200 - 6000
Laser	Ytterbium fiber laser
Max. power consumption	28.5 kW
Power supply	380 V (AC)
Axis X	Servo drive with anti-backlash gear, precision rack pinion
Axis Y	Linear drive with precision measuring scale
Axis Z	Servo drive with anti-backlash gear, additional tracking feedback, precision ball screw
Axis R	Linear drive & Servo drive

Modules for tube cutting

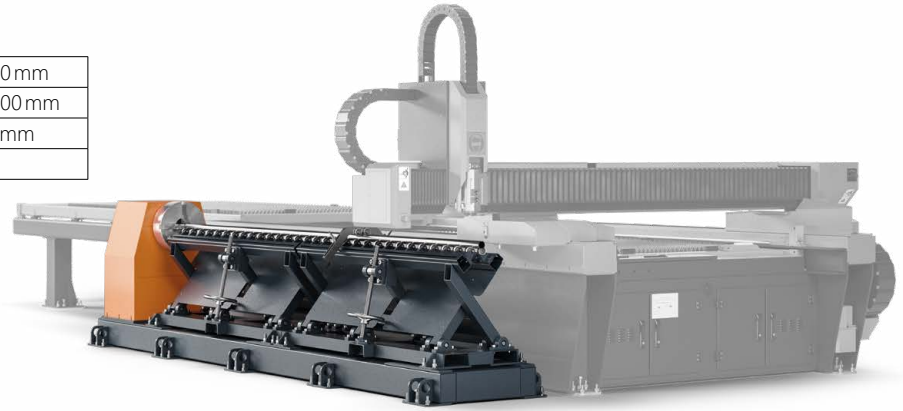
TCU-STANDARD

is used as a part of laser cutting machines
- UNIMACH LC PROFESSIONAL M3,
- UNIMACH LC MASTER DIRECT,
- UNIMACH LC MASTER SERVO.

Cutting tubes up to 3 m.

Features:
- user-friendly interface
- high economic efficiency

Round tube diameter	up to 320 mm
Tube length	up to 3000 mm
Tube wall thickness	up to 10 mm
Max. tube weight	250 kg



TCU-PROFESSIONAL

is used as a part of laser cutting machines
- UNIMACH LC PROFESSIONAL M3,
- UNIMACH LC MASTER DIRECT,
- UNIMACH LC MASTER SERVO.

Cutting tubes up to 3 m.

Features:
- cutting tube at angle
- modular design

Round tube diameter	up to 250 mm
Rectangular tube section area	up to 175×175 mm
Tube length	up to 3000 mm
Tube wall thickness	up to 10 mm
Max. tube weight	250 kg

TCU-PROFESSIONAL M3

is used as a part of laser cutting machines
- UNIMACH LC PROFESSIONAL M3,
- UNIMACH LC MASTER DIRECT,
- UNIMACH LC MASTER SERVO.

Cutting round and rectangular tubes up to 6 m.

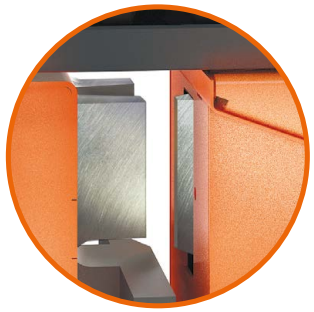
Features:
- cutting tube at angle
- modular design

Round tube diameter	up to 250 mm
Rectangular tube section area	up to 175×175 mm
Tube length	up to 6000 mm
Tube wall thickness	up to 10 mm
Max. tube weight	600 kg

Automated process of tube cutting

Laser head is cutting the tube next to the steady rest that securely locks a workpiece and prevents it from oscillations.

After processing this area, the head is moving to the centre of the gantry to provide some space for the gantry to pass over the steady rest. The gantry is moving, and its moving projecting part shall be located right opposite the mating hole on the steady rest.



Once the two parts are locked together, the gantry is moving the steady rest along the processed tube.

Then, the projecting part is getting back to the initial position. The gantry is moving to the next cutting area. The laser head is moving to edge of the gantry and ensures cutting behind the steady rest.

Automation system
UNIMACH UNIMOVER

UNIMOVER system ensures moving of sheet metal from the load shelf to the working table, and ready products — from the working table to the unload shelf. All processes are carried out automatically without operator's work.

There is no need to stop the machine while moving raw material and ready products. All system components are located above the automatic pallet changing system and do not require any additional space.

The automaton system is designed to provide aid in working processes, to load and unload material without operator. Outfitted with suction cups, the vacuum system puts the sheets on the pallet table, and the forklift unloads the ready products.

Max. lifting height, mm		1250
Forklift load capacity, kg		290
Max. load to load shelf, kg		3000
Max. load to unload shelf, kg		3000
Min. sheet metal thickness, mm		1
Max. sheet metal thickness, mm		8
Diameter and number of suction cups		Ø 100 mm, 30 pcs.
Dimensions, mm	**Length**	5000
	Width	6500/4200 (forklift pilled in/out)
	Height	3900/3770 (forklift lifted up/down)

Pneumatic loader

UNIMACH UNIARM

Pneumatic manipulator UNIARM simplifies loading of sheet metal and provides convenience, high speed and safety.

Model		UniArm 3015	UniArm 4020
Weight, kg		4200	4500
Suction cups		12	18
Suction cups diameter, mm		250	250
Max. power consumption, kW		3	3
Load capacity, kg		900	1100
Max. lifting height, mm		800	800
Min. sheet thickness, mm		0.5	0.5
Surface type		Level surface, minor greasy stains allowed	Level surface, minor greasy stains allowed
Loading movement		Horizontal	Horizontal
Power supply		400 V, 50/60 Hz	400 V, 50/60 Hz
Angle of console rotation, °		80	80
Dimensions, mm	**Length**	5150	6150
	Width	2440	2690
	Height	2910-3710	2910-3710

Automatic laser welding machine **UNIMACH COBOWELD**

Unimach LaserWeld + collaborative robot (cobot) – for industrial application 24/7.

Unlike other robotic manipulators, cobots are absolutely safe. They can be used without an additional safety fencing or limiting the access.

CoboWeld ensures automatic high precision laser welding of metal workpieces. It is out-fitted with an automatic wire feed unit to the welding area providing perfect welding of the complex contours.

Collaborative welding significantly improves welding precision, weld seam consistency, constant repetition and increases production efficiency ten-fold.

Features

- **Safety**
  CoboWeld is considerably safe for humans, which makes it possible to use CoboWeld alongside operators without an additional safety fencing. Integrated pressure sensors will immediately stop a manipulator if it meets an obstacle or barrier including a human body.
- **Space savin**
  Compact design and simple installation enable to put CoboWeld into operation quickly.
- **Quick installation**
  No special surface is required for installation. Power supply — 220 V.
- **Utmost repeatability**
  CoboWeld can be used at an assembly line: the welding program ensures multiple constant repetitions of a single contour with high accuracy. CoboWeld delivers consistent high quality weld for each workpiece.
- **Easy to use**
  CoboWeld has a user-friendly intuitive interface so there is no need in additional long-term personnel training. It is portable, easy to adjust and can be quickly moved around the production facilities. The manual mode of Cobot software is able to memorize a sequence of operator's actions and fully repeat them.

LaserWeld

Power, W	1000-3000
Wavelength, nm	1060
Laser type	Continuous / pulse
Max. speed, mm/s	120
Cooling system	Chiller
Operating temperature, °C	from +15 to +35
Humidity	<70%, free of condensate
Root gap, mm	≤0.5
Weld thickness, mm	0.5 - 5.0
Voltage, V	220

Cobot

Max. load, kg	9
Reach range, mm	2400
Operational zone, mm	2152
Repeatability, mm	±0.05
Quantity of axes	6

Laser welding machine

UNIMACH LASERWELD

LaserWeld is a state-of-the-art development designed to ensure welding of all types - butt, corner, tee-butt, circumferential, etc., without further processing. It is outfitted with a wire feeder to weld the parts with poor fit-ups.

Operating principle

Laser beam is delivered to the weld seam causing heating, melting and evaporation of particles on the edge. Melted metal fills all defects and micro-roughness creating high density weld. Manual gun allows for welding in hard-to-reach places: inside cavities, in the corrugated structures, etc.

LaserWeld features

- **Utmost speed** — much higher than the arc welding
- **High quality weld.** No heating of weld-affected zone.
- **Automatic wire feeder** to weld workpieces with rough edges
- **Non-standard workpieces** — welding of long surfaces, hard-to-reach places and angle welding
- **Other**
  - Minimum amount of consumables
  - Simple operation and maintenance
  - Easy to move around

Power*, W	Wave length, nm	Laser type	Speed mm/sec	Cooling system	Operating temperature °C	Humidity	Root gap, mm	Weld thickness, mm	Overall dimensions (L×W×H, mm)
1000-3000	1060	continuous / pulse	120	Chiller	+15 .. +35	<70 %	≤1	0.5 – 5.0	1132.5×700×1220 mm

*May differ depending on the laser type

Air filtration unit

UNIMACH AFU-8

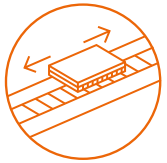
AFU-8 filters air from dust, solid particles and smoke during welding, cutting and cleaning, and other operations.

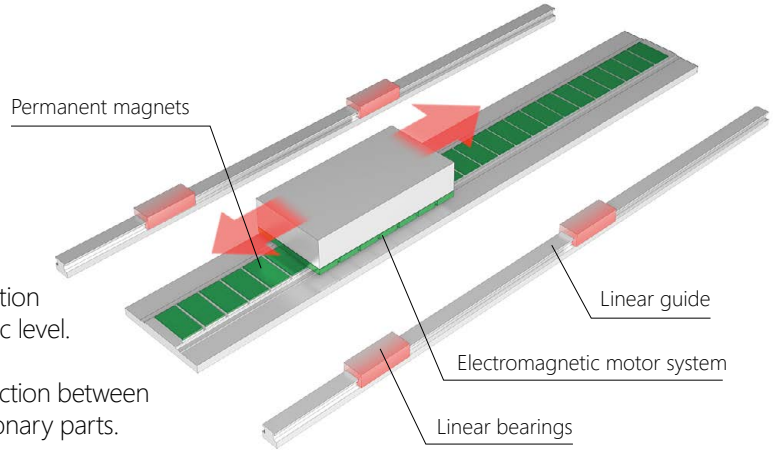
Features

- **Low noise and high efficiency**
  owing to digital inverter drive that ensures smooth start and stepless adjustment of suction power
- **Electricity saving**
  Inverter drive with smart control leads to decreased power consumption (incl. standby mode) when full operation power is not required.
- **Cyclone Pre-filter**
  removes the main part of contamination leading to longer life time of filter elements
- **Special shape of filter elements**
  increases total system efficiency and filter life time
- **AFU Electronic controller**
  for smart measurement of filter clogging and starts cleaning if necessary
- **Touch screen display**
  with intuitive interface ensures user-friendly presentation of operational parameters and system notifications
- **2-year warranty**

Weight	1700 kg
Overall dimensions (L×W×H)	2130×3225×1845 mm
Flange connection	Ø 355 mm
Efficiency	8000 m^3/h
Pressure of pneumatic strike to clean filters	8 bar
Power supply	380 V, 50 Hz
Max. power consumption	5.6 kW

UNIMACH® features





Linear drive interaction at the electromagnetic level.

No mechanical interaction between the moving and stationary parts.

Drives ensure high precision, dynamics and speed of movement with no backlash and significantly increase the machine's performance.

VPG Laserone lasers

- designed on the basis of fiber lasers are the most reliable among the existing ones. Their operating lifetime exceeds a decade;
- high quality and stabile beam parameters;
- maintenance-free. No contamination, as lasers are located in the entirely sealed body;
- no need in consumables;
- great solution for cutting highly-reflecting materials (latten, aluminium, copper, galvanized and stainless steel, etc.) and for metal engraving.

Beam delivery by a fiber-optic path without mirrors minimizes an amount of necessary consumables. The fiber system is absolutely reliable; its lifetime can be compared to the laser itself.

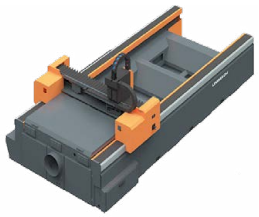
Coordinate system calibration to a precision of tens of microns

The calibration is carried out by means of the laser interferometric measurement system XL-80 and ballbar diagnostics QC-20W by Renishaw.

Positioning accuracy along the X, Y, Z axes is ±0.050 mm/m; repeatability along the X, Y axes – ±0.025 mm.

Elaborate arrangement

Designed as separate modules the significant part of units is usually integrated into the machine. This arrangement saves space and makes work more convenient. To provide additional comfort all external connections are carried out from one side.



Efficient cooling system

Equipment cooling is carried out using chillers made by NPK Morsvyazavtomatica. They are fully compatible with the machines and units Unimach®, simple in use, reliable and almost maintenance-free.

Laser cutting head UNIMACH LH-201 (p. 34)

LH-201 features automatic lens focusing system, new generation side tracking system and optimized system of cartridge lens replacement.

Collision protection system. Side-collision sensor scans the space around the cutting head. If uplifted parts or other obstacles are detected the machine's CNC uplifts the cutting head, moves it at this height safely. Once the hazardous area is passed, cutting can be automatically resumed or stopped – depending on the settings.

Zoned smoke exhaust system

The system switches on only at the exhaust zone of cutter operation.This solution makes it possible to use less productive ventilating system and to exhaust smoke with extreme efficiency, as well as save the electricity.

Machine bed

The machine bed is an all-welded heat-treated structure with subsequent machining and polishing. To withstand high dynamic loads the structure is additionally made heavier. It combines high accuracy of production, rigidity, reliability and long life.

Gears and drives

Laser cutting machines Unimach® are equipped with reliable mechatronics elements from leading international manufacturers. Mechanical, electrotechnical and computer components ensure uniform, quick and accurate movements of any parts not depending on their weight and size.

Centralized lubrication system

Moving parts of any machine require regular lubrication; they are often covered with protective casings or bellows at high quality equipment, which is, however, limiting the access. Unimach® has equipped the machines with the centralized lubrication system and maintenance timer. Lubrication oil is supplied automatically to the mechanisms in the set time intervals. Dismantling of protective casings is not required.

A CNC stand notifies an operator about the operation including information on the residual oil in the container and notification to fill the oil up when it finishes.

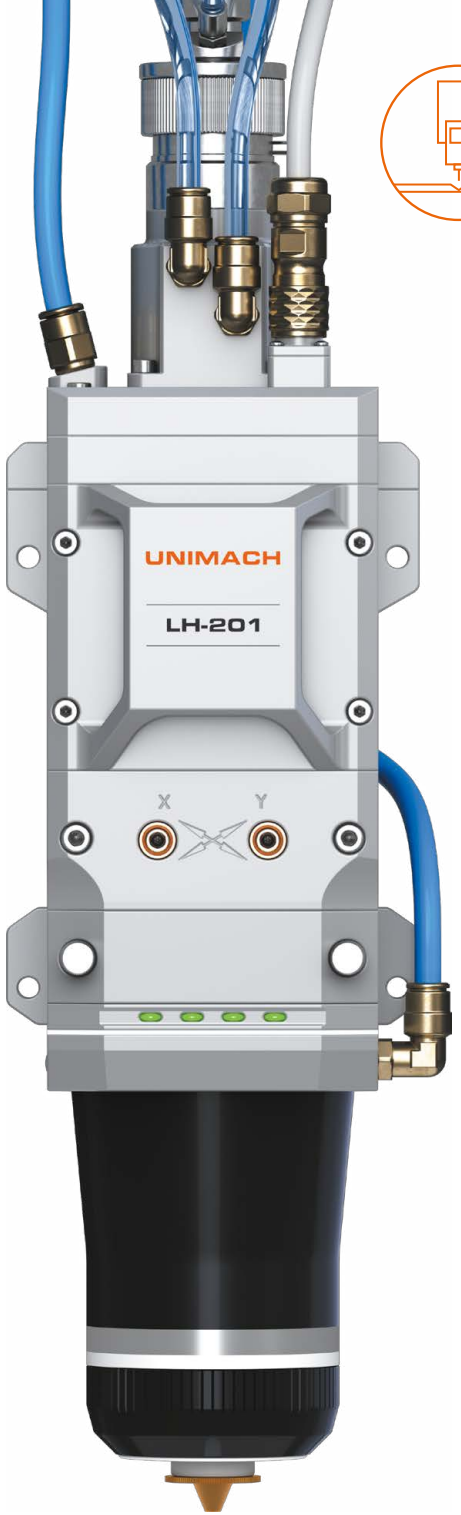
Gas supply system

Automatic gas console is one of the crucial components of entry-level laser cutting machines Unimach®. When an operator selects a material in the library, the console automatically supplies the required gas.

UNICUT software (p. 38)

Along with the delivery of the machines, our company creates software to control their operation. Our engineers have designed UniCut software especially for laser cutting machines Unimach® to reveal their true potential and functionality.

Laser cutting head UNIMACH LH-201



State-of-the-art solution for laser cutting machines

Compact and light, the optical head ensures quick and precision movements. Efficient cooling system enables to use lasers with power up to 20 kW.

UNIMACH LH-201 features

- Collision protection system
- Reliable insulation of collimator and focusator
- Quick replacement of protection window
- Nozzle centering in the focusator
- Adjustment range of focal length: from +15 to -35 mm
- Change of focal length without stop in operation (incl. piercing)
- Collimator with aspherical optics enable to work with bigger thicknesses, increase speed and higher cutting quality

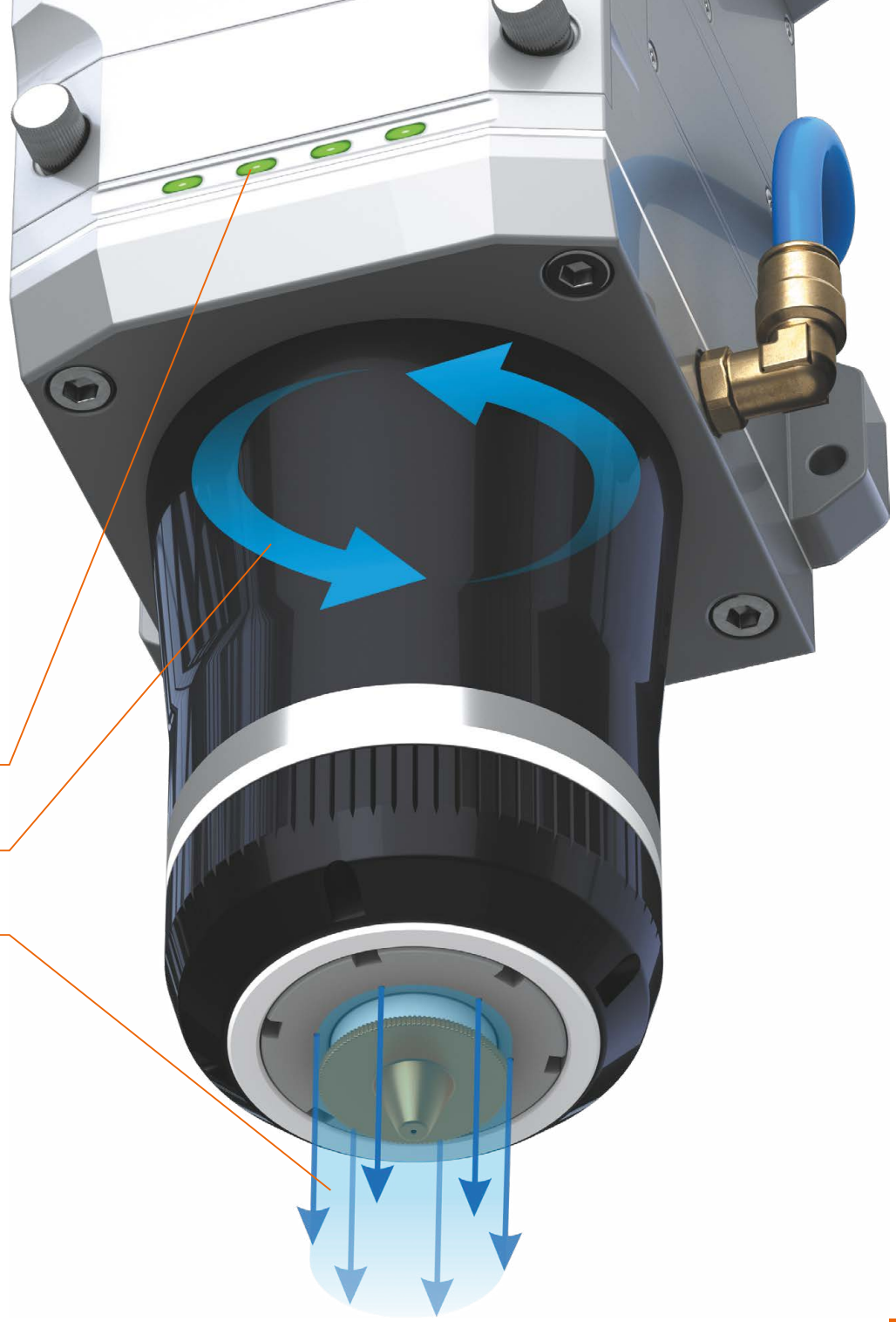
- Lens:
  - electromechanical lens drive
  - automatic control of lens position
  - automatic focus settings from the Library
  - supports focus length 200 mm

- Cooling of cutting area:
  - forced blowing of piercing point
  - nozzle blowing
  - nozzle water cooling

- Contamination control:
  - collimator
  - focusator
  - protection window

- Sensors:
  - FoCut tracking system
  - air temperature and humidity in the chamber
  - pressure in the working chamber
  - air contamination in the top chamber
  - nozzle temperature
  - gas leaks into focusator's chamber
  - protection cartridge and integrated window

- Enhanced sensitivity of sensors (FoCut system – up to height 70 mm, side tracking – twice more sensitive than the previous model)
- Z-axis controller is connected via a digital bus (integrated control systems for laser head and data acquisition from integrated sensors)
- LED indication of the cutting head status



Control console

All controls – within reach

All controls and LEDs are located on the front panel providing a convenient working environment.

UniCut software

Simple and user-friendly software UniCut. USB ports to connect flash drives or download drawings and programs.

Protected control system

The cutting machine is protected from unauthorized access to power.

Keyboard and mouse

Full-sized keyboard and mouse create conventional and comfortable working atmosphere.

Flexible application

The console may be used with or without a protective enclosure.

Control system

All Unimach® equipment is controlled from one workplace using one software – UniCut. Simple and user-friendly interface allows an operator to export and import the drawings, create cutting programs, control shuttle table and pull-out pallet, monitor system's status and service maintenance schedule.

Remote control panel

Using this control panel an operator can do the most common operations remotely: start and stop, back travel along the contour, set a machine and workpiece zero point.

Control panel of the shuttle table

A panel is built into the protection enclosure. An operator is capable to change pallets in the manual mode, as well as start and stop an automatic mode.

Unimach® Cordless Scanner

Quick loading of cutting programs simplifies operation and is a great help for paper documentation. An operator receives the printed task with barcodes, scans them and then the machine's CNC automatically downloads relevant cutting programs.

The scanner is made of ABS, withstands multiple drops from 1.2 m height onto the concrete. IP rating – IP65.

Focal length control system FoCut

Focal length control system FoCut is the most efficient solution of those represented in the market.

FoCut controls a stable position of a cutting head with precision of 0.02 mm within the wide range of heights. It ensures precise cutting both on the workpiece edge and highly deformed metal sheet.

Technical specifications

High sampling rate (100 kHz)
ensures minimal response time of the tracking system.

- Sampling rate: 100 kHz
- Tracking accuracy ±0.02 mm
- Control of focus lens position, service upper position
- Control of cutting head drive, differential pair A+B (max. frequency 500 kHz)
- Lens drive control – digital data line
- Digital communication line for cutting head 10 Mbit/s
- 3 differential discrete outputs for system status indication
- 3 differential discrete inputs for discrete system control
- System control and programming using UniNET network
- Input to connect a feedback sensor (encoder) of cutting head drive: differential pair A+B (max. frequency 20 MHz)

Key features

Pre-heating of the cutting area
Cutting thick material requires pre-heating. An optical head lifts up to the preset height and heats the cutting area; then it goes down and cuts the material.

Digital detection of workpiece edge
Using a capacitive sensor, the system monitors metal surface. If metal suddenly disappears under the nozzle (e.g., beyond the sheet edge) it sends an alarm signal to CNC and uplifts the cutting head to the upper position.

Digital collision sensor
The system monitors the deviation of cutting head current position from the preset one. In case of collision or any other obstacle detected, it sends an alarm signal to the CNC and automatically lifts up the optical head to the top position.

Shortened height
While moving from one piercing point to another an optical head lifts up to the shortened height enabling to save time and increase the system efficiency.

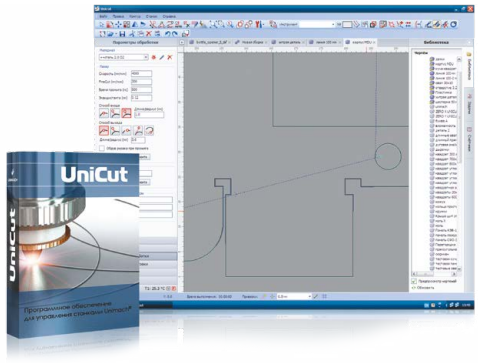
Jump up piercing
At the moment of piercing an optical head is uplifted to the preset height preventing the nozzle from contamination by the melted metal. Then, the further cutting is carried out from the preset focal length. This method helps to use the consumables – a nozzle and protective glass – efficiently and avoid possible errors or malfunctions.

Additional collision protection
Additional protection system automatically detects hazardous areas (uplifted parts, holders that were not included in the safe areas, etc.) in real time. If an obstacle is detected the cutting head lifts up, moves to the safe area, or operation is put on hold.

S-curve acceleration
Owing to this function, an optical head achieves smooth, but dynamic running. S-curve acceleration protects against self-oscillations while cutting thin materials and removes shock load of the optical head drive.

UNICUT software

We design high and low end CNC software expanding the equipment's functionality and satisfying the highest demands of our customers.



Simple intuitive graphic interface of UniCut ensures easy and convenient operation.

To save time and optimize cutting processes UniCut provides the special functions such as pause, back movement along the contour, quick transition to any piercing point, quick change of piercing point, cutting can be initiated from any point of contour. The software also represents a set of functions to automatize a lot of typical operations: automatic selection of contour cutting initial point, automatic calculation of movement's dynamic parameters, automatic control of match with the initial drawing, etc.

Cutting programs

- Automatic nesting
- **Back movement** function and quick transition to any piercing point
- Own system to upload, store and process cutting programs
- Imitation of cutting
- Display of a list with recently viewed or created programs
- Display of machine zero, workpiece zero and cutting area zero
- Dynamic display of Focut system operation
- Automatic calculation of dynamic parameters for movement along all axes (incl. Look ahead function)
- Function to shorten (cut) projecting parts of a workpiece to the required size
- Database of materials

UniCut automatically compares a workpiece and source file and notifies an operator about any changes. It prevents from possible defects in case of modifications and updates of workpieces. Remote diagnostics of malfunctions using 3G/4G modem or Internet.

Work with drawings

- UniCut supports all types of graphical data: lines, arcs, ellipses, polylines, splines, blocks.
- Graphic data interpolation (e.g., splines) is done automatically, «on the go» while uploading the detail draft.
- Integrated creation of geometric primitives.
- Quick uploading of drawings. High-performance intelligent algorithms of UniCut ensure automatic uploading of the most complicated drawings and creating the cutting program.
- Possibility to edit vector components of the ready drawing, as well as make drawings of new details from the scratch using user-friendly tools of automated designing.
- Possibility to read and set microjoints.

Uploading drawings is 60 times faster than the CAM system!

- UniCut supports DWG, DXF files, G-codes and CL-codes. Once the drawing is uploaded the system automatically creates a cutting program. In 95% of cases it doesn't require any further corrections by an operator or production engineer.
- UniCut software supports G-code programs of all leading international manufacturers: Trumpf, Amada, Bystronic and others.
- When a user introduces changes into a detail, the program automatically creates new cutting file. The changes will be applied to the rotated and mirrored details.
- Scaling of workpiece with all piercing points.
- Multiplication, mirrowing and rotation features lead to optimal material consumption.
- Automatic select of contour initial cutting point.
- To provide more operational comfort UniCut represents a function of draft preview. Preview window appears automatically at mouse hover on the workpiece file.

Unparalleled performance

UniCut automatically optimizes configuration of contours to increase cutting speed maintaining the set accuracy. It allows for quick and less labour-consuming uploading and processing piecewise linear interpolated contours which can be often found in the drawings of complicated details cubic and quadratic curves.

Automatically created cutting program do not require any operator's correction in 95% of cases.

Quality and performance

Automatic nesting saves time of operator and technician
UniCut software includes integrated tools for automatic nesting providing optimal distance between the details and workpiece edge. This function saves time both for a technician and operator and decreases amount of scrap. Optimal nesting reduces total time of cutting operations.

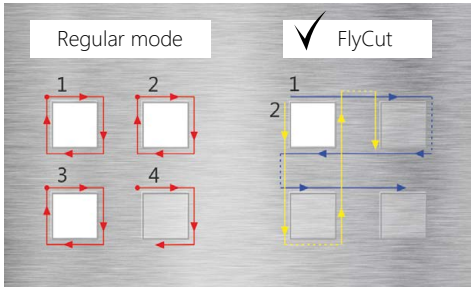
Create an automatic program in two steps
The program automatically detects the nested contours and calculates the most optimal travels. This function is useful for small enterprises that are dealing both with small batches and a wide range of products.

Laser power can be controlled depending on the speed
To reach higher quality of sharp and right angles laser power can be controlled automatically depending on the speed of the optical head. At zero speed (at the moment of stop at the corner) output power equals to minimum power configured in the settings which prevents the corner from a burnout.

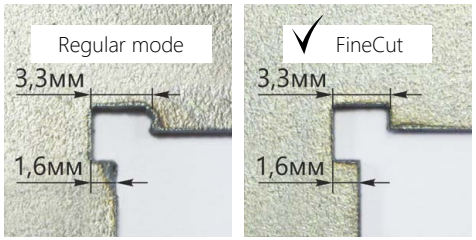
Safe areas
Safe areas are the areas where clamps or holders are located (on a deformed sheet). They are also considered when software creates collision-safe travels.

If an optical head enters this area, the contour is not processed, and the machine is put on hold. An operator needs to move a holder, provide new settings for safe areas in UniCut and continue cutting operations. Safe areas (mm) are set by an operator.

FlyCut — reduced time for thin sheets cutting. FlyCut is cutting all contours located in one line that significantly reduces time of processing thin workpieces. Line by line, an optical head covers the whole workpiece at high speed, cutting contours at the relevant area. This technology is ideal for perforated grilles processing.



FineCut – a solution for complex shapes
FineCut processes the complex shapes. Some specific areas – at the corners or close to each other – are processed in the pulsed mode. Switching between FineCut and regular mode occurs automatically in accordance with the settings.



Steel cutting samples 1.5 mm (oxygen, 6000 mm/min)

Convenient operation and service

Individual settings for laser piercing, engraving and cutting. Modes can be set individually to ensure optimal quality of the metal cutting.

Automatic switching between the cutting modes
There's no need to stop the process in order to change or enter the new settings. Switching among the modes occurs automatically leading to higher production capacity of the cutting machine and cutting down on consumables.

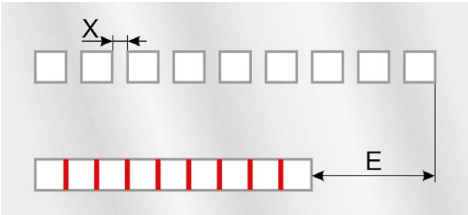
Library of materials
UniCut software includes the Library of materials where a user can find recommended settings for particular materials combined with the function to create new ones.

Software timers
The software automatically calculates hours in service for various machine units and informs an operator on the required service.

Economics and control

Common cut

Common cuts are the result of nesting parts so close to one another that they share an element. This reduces waste material and results in optimal metal consumption. X – distance between contours in regular cutting mode; E – difference in length between contours that were cut out in different modes. Here, E=8X.



Collision-safe travels

Some cutout workpieces and parts can lift up and become an obstacle on the way of an optical head. Function of collision-safe travels automatically bypasses hazardous areas. The program controls the motion of optical head and prevents it from getting into the areas where the cutting has been already done.

Automatic calculations of cost

Software automatically calculates cost of separate parts and all cutting program, cost of cutting hour or meter, or a single piercing of the particular material, or other parameters on request.

User access rights

UniCut allows for setting different access rights to the machine's functions depending on the operator's qualifications or objectives. The rights may be given to an operator, technician or service engineer. A user gets a right or restriction to change cutting parameters, provide settings, start a program, etc. The rights are managed using a convenient UserAccess tool included in the main software.
Authorization is made by RFID-tag (including Indala), barcode or by entering login/ password.

Additional functions

- **Skeleton scrap cutting of inner contours.** UniCut automatically detects contours that can become obstacles on the way of cutting head. It creates a microprogram to cut an inner contour into smaller ones preventing them from uplift.
- **Extended equipment log.** Detailed current operational data and all operator's actions – start and stop of the program, manual movements, etc. - are recorded to the database. This information may be used for work load analysis, production efficiency and personnel control. Software for analysis is also delivered together with UniCut.
- **Control the tasks using barcodes.** Unicut software ensures control over operator's objectives using barcodes. An operator just needs to scan a barcode from the list to download a required cutting program.
- **Quick search in the library of cutting tasks.** The program allows for searching the cutting program file all over the Library. The search is done by the details' names, customers or any other words.
- **Hot keys** for quick access to the main functions. Just press a key and create or start a cutting program, free runnings at the preset speed, etc.
- **Evaporating mode.** This function allows for processing metal coated with paint or film: at the first stage, the coating is removed; at the second - the metal is cut.
- **Automatic detection of piercing programming errors.** The errors are displayed on the cutting plan.
- **Create programs for cutting square and round tubes.** Cycles of workpieces' automatic loading and cut parts' unloading.
- **Making changes to details' assemblies and drawings can be optionally restricted.** Depending on the settings a restriction can be put to details' geometry changes, or location of the details within the assembly. Still any parameters that affect the detail's processing can be changed: bypass parameters, piercing points, equidistants, etc.
- **Reset of all changes** to the default values.
- **Integration** with production control system **Winnum**.

Side collision protection system

Some parts can uplift above the sheet during laser cutting. If the cutting head collides with the uplifted part either the sheet may shift or a ceramic spacer may break.

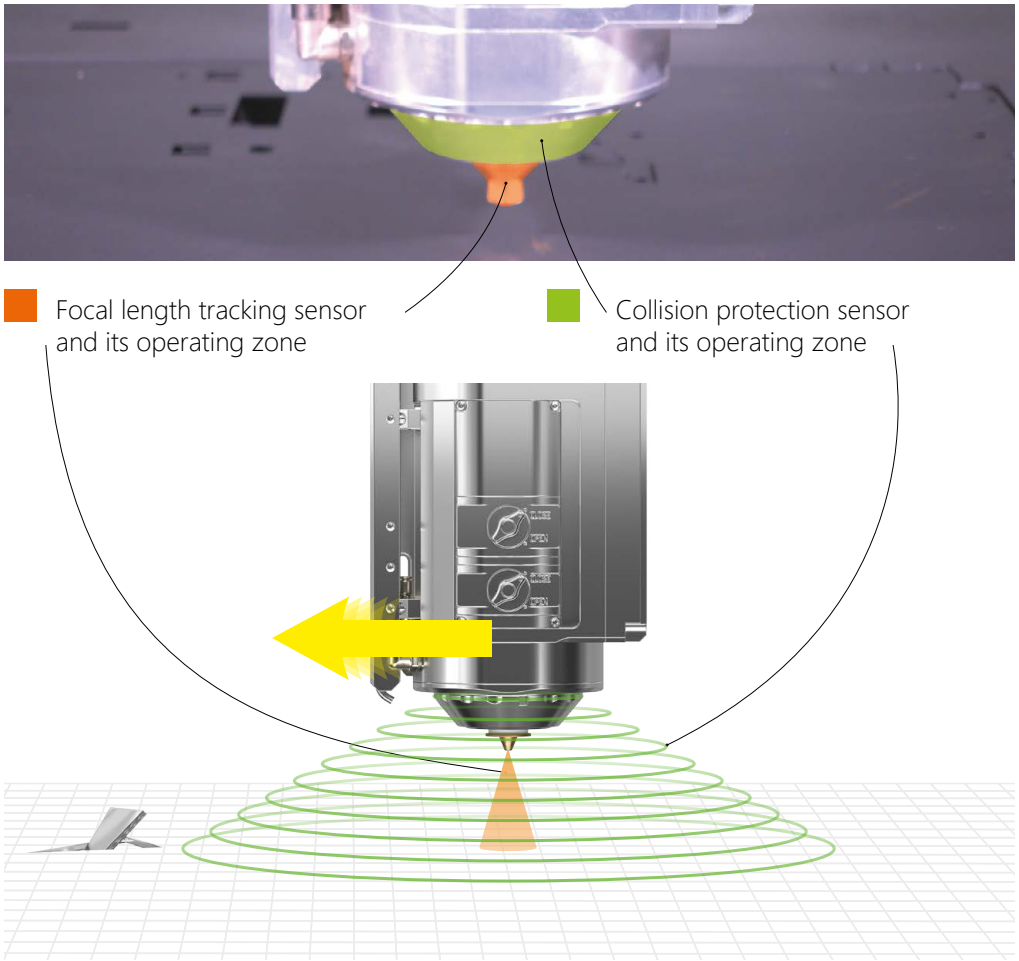
Side collision protection system protects against such incidents and ensures safe operation.

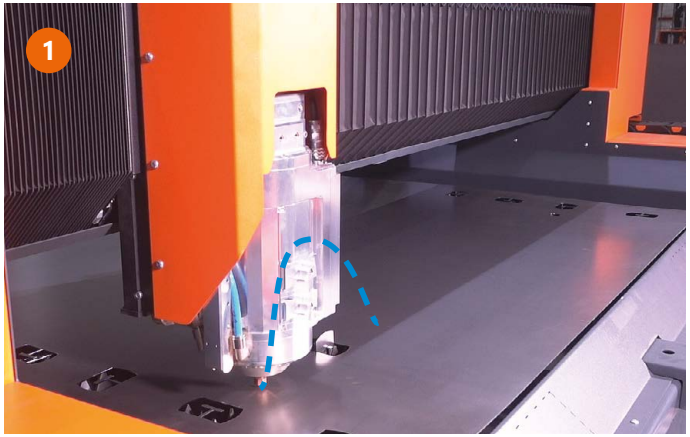
Such system cannot be designed simply by using standard sensors of focal length because they can only track the space between the head and the surface, and can miss objects coming from the side.

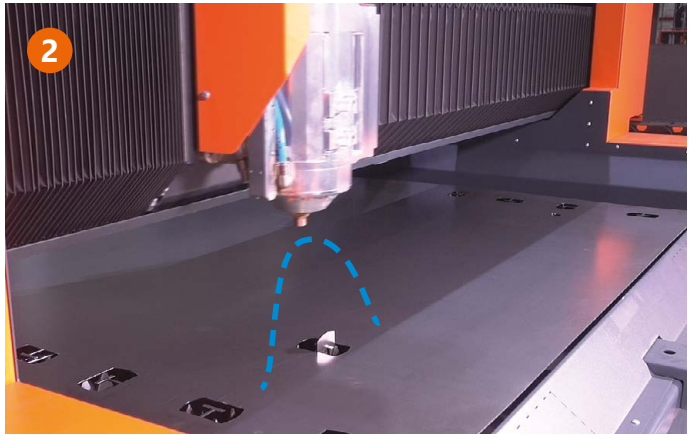
Special sensor and module to track the surrounding are required to protect the equipment against side collisions.

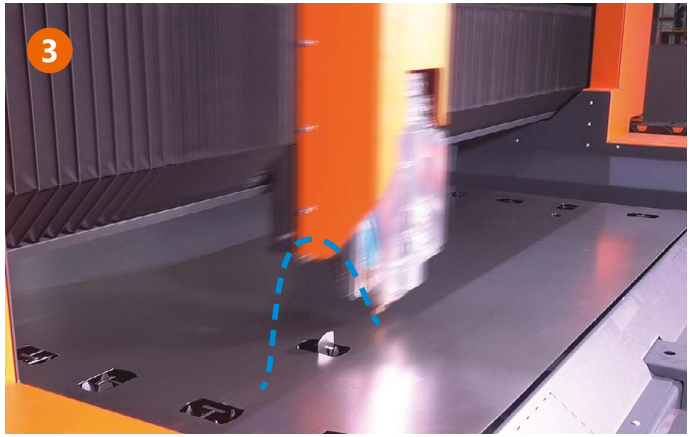
All laser cutting machines Unimach® are outfitted with optical heads that include side collision protection system.

If an obstacle is detected during an idle run the cutting head lifts up, moves to the set point safely not interrupting the cutting program.

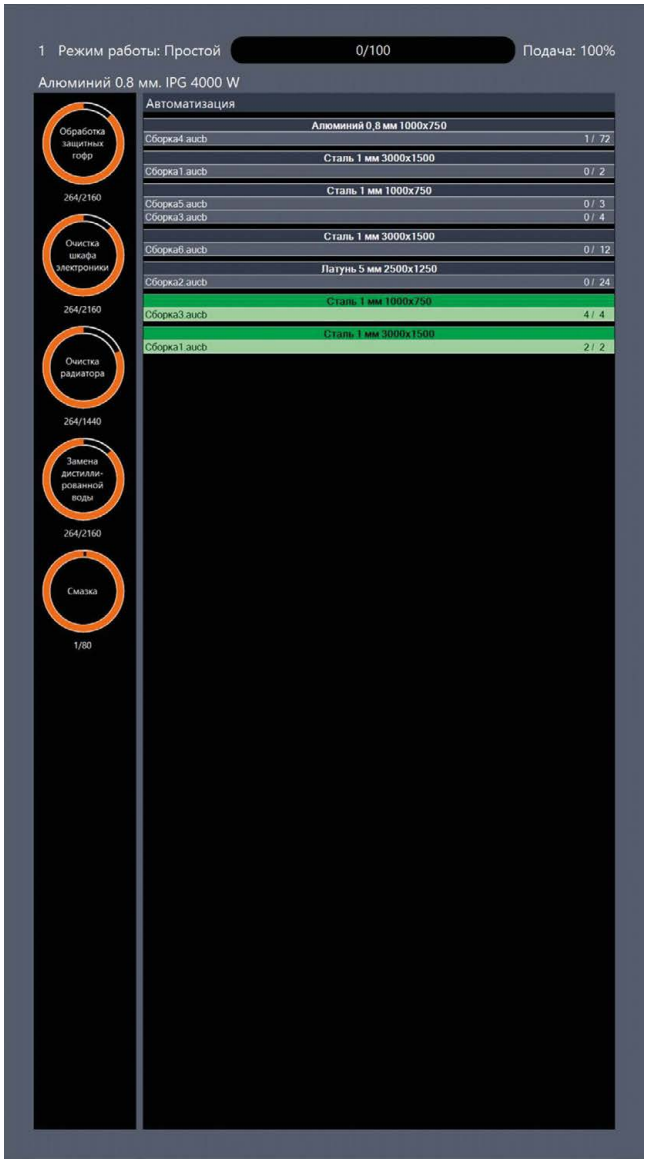


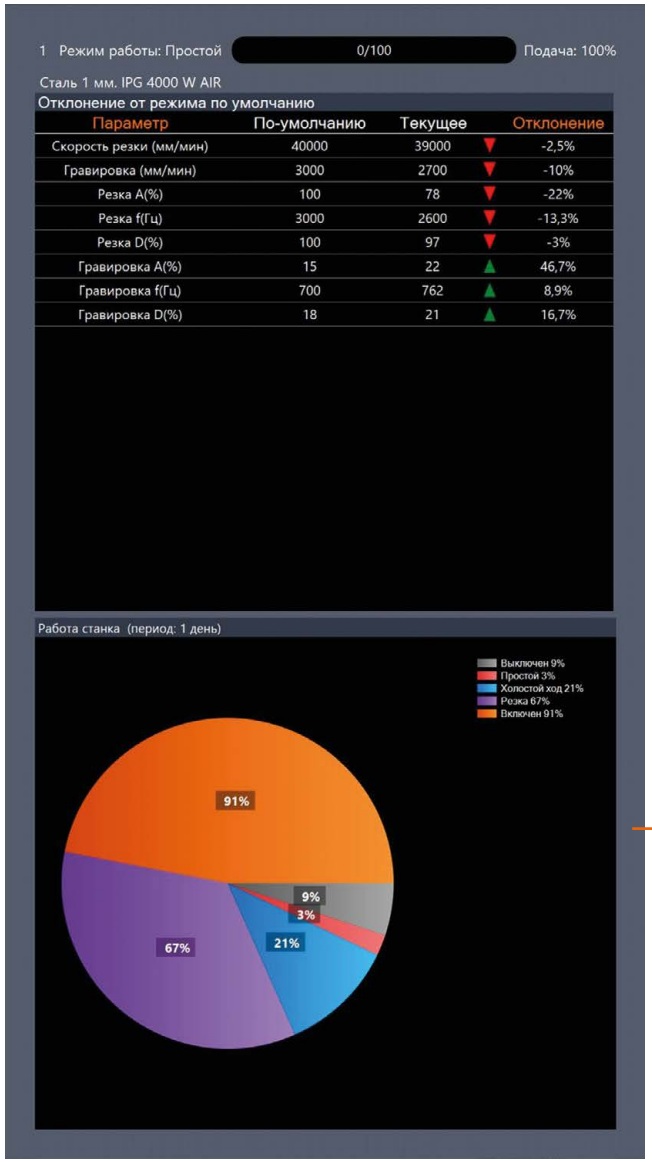






Lean production system.
Industry 4.0 ready





Information on the current file, material, completion of the cutting program in percent, operating mode and loading.

Productivity control system UniControl

User-friendly system to display machine performance enables to monitor efficiency of equipment. Displayed data are easy to analyze and do not require further processing.

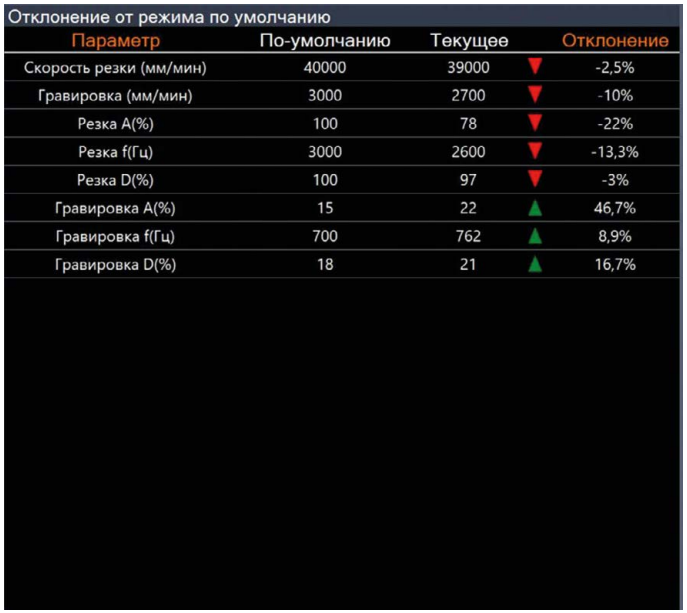
The system measures and processes particular manufacturing parameters:

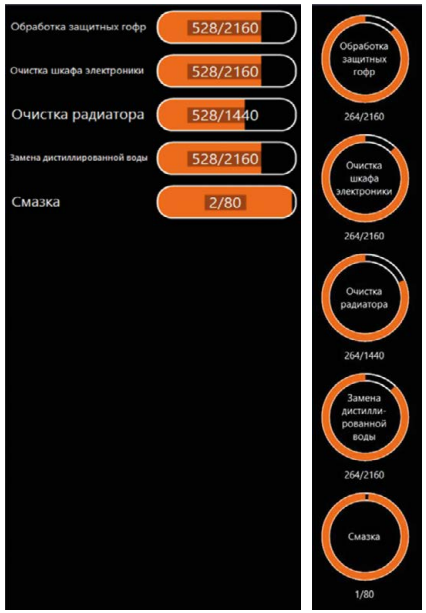
- readiness to work,
- sheet data and parameters,
- metal consumption,
- production and scrap,
- stock assortment,
  etc.

Wide range of manufacturing data simplifies control and increases efficiency of production facility.

Configurable reports

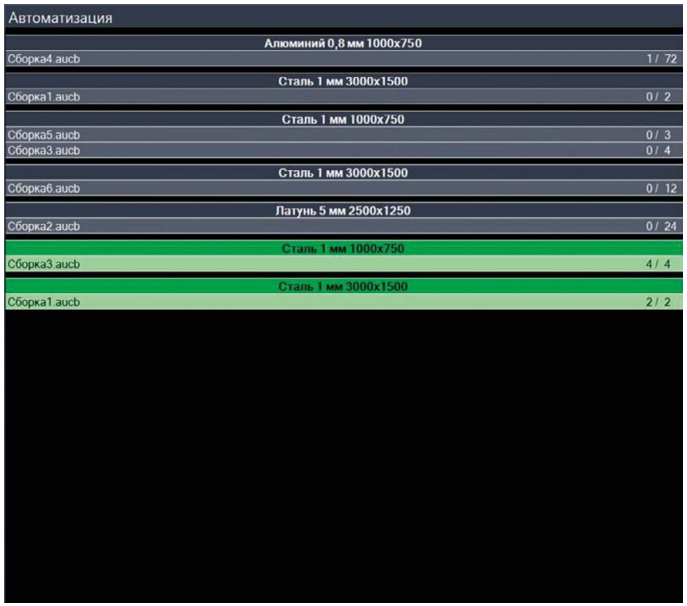
We can develop reports based on any types of data in the required visualization format on request.

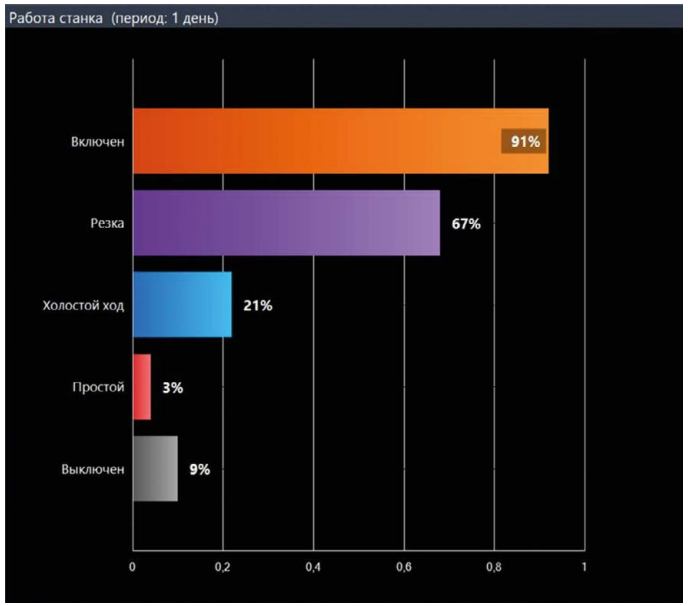


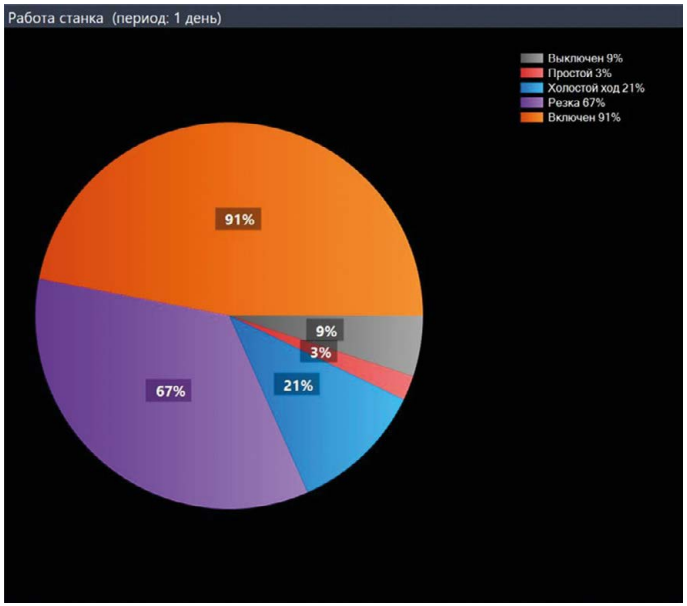


←←**Default mode deviation** screen displays recommended and current cutting settings (materials and machine), and deviation of working setting from the recommended ones in percent.

←**Maintenance timers** screen represents the usage of consumables and units in percent, and shows the completeness of the warehouse with spare parts. Two types of graphs are available: a progress bar and pie chart.

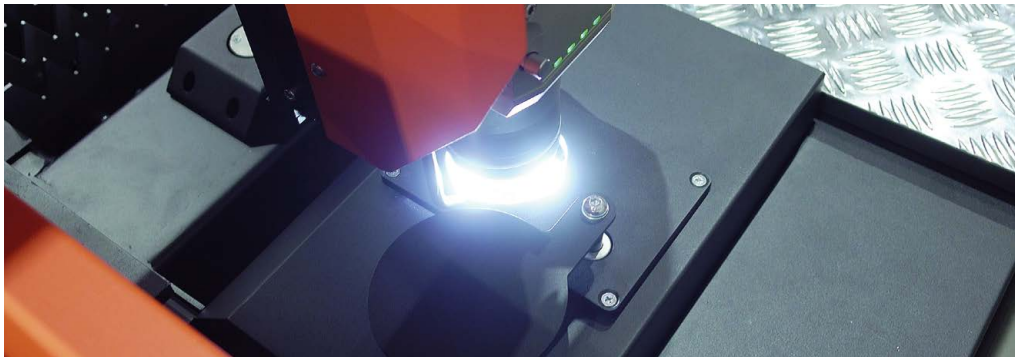






↑**Automation** screen displays current status of files in line.

↑**Machine operation** screen displays a machine status during the selected time. It represents operation time, down time due to waiting, error or settings. Total time of free running is also displayed. Graph has three types: bar graph for the time, pie chart for the time, and a pie chart representing the last shift.

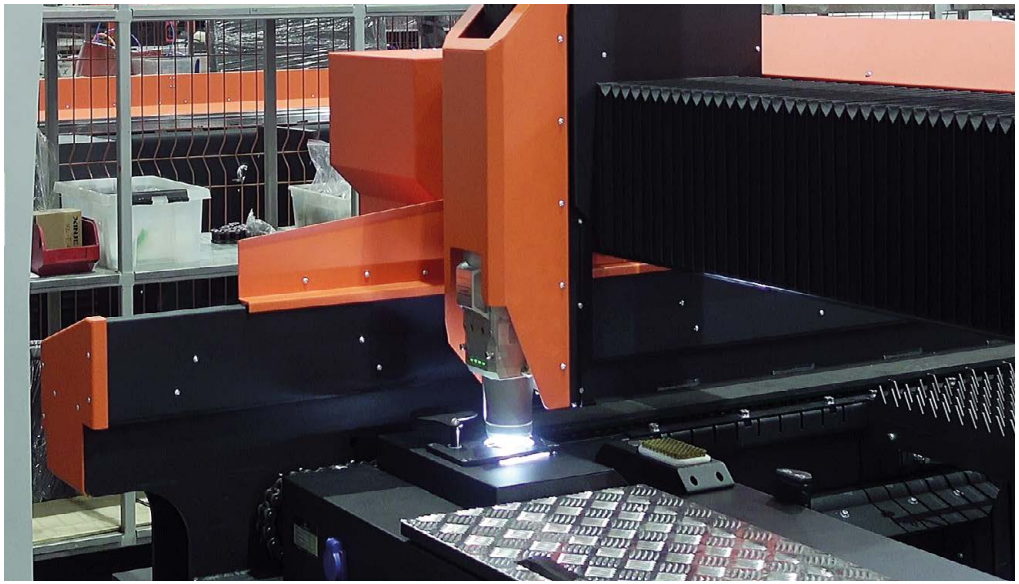


Beam centering module by means of camera

Beam centering module by means of a video camera is designed for quick and convenient beam alignment relative to the centre of the laser head nozzle.

The majority of laser cutting machine manufacturers offers a conventional way of the beam centering that suggests using a beam mark on the adhesive tape.

Unimach machines enable an operator to align the beam directly by the image that is being displayed on the CNC monitor in the real time. This solution increases efficiency of the equipment and makes operator's work easier.

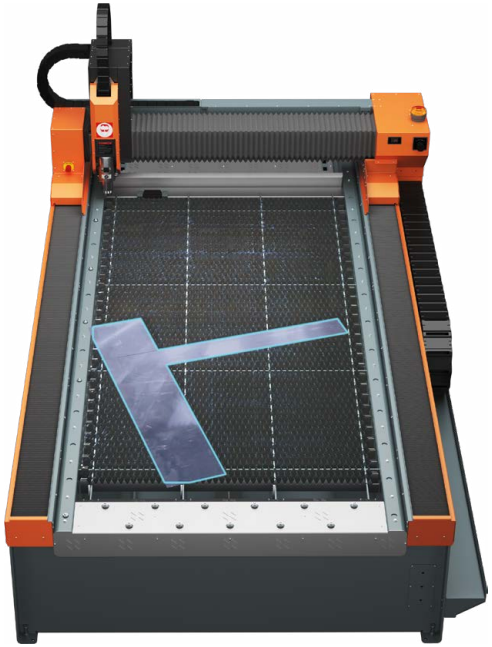


Machine vision system UniVision

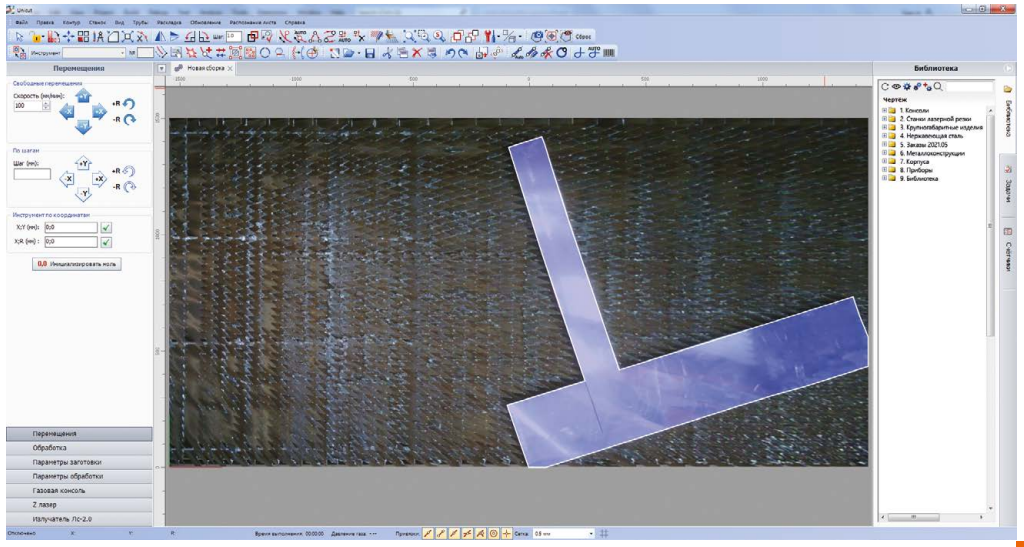
The system significantly simplifies and speeds up a process of sheet or workpiece positioning.

- Reduction of total processing time
- Cutting down on operational expenses
- Decreasing payback time

UniVision includes a digital video camera installed on the laser cutting machine that ensures filming the working area. Using the video an operator can ensure nesting directly on the image. After the start of cutting, CNC unit will automatically correct visual position of the workpiece.



While using automatic nesting, an operator may make corrections by indicating a shape of the workpiece or redesigning it manually by points.

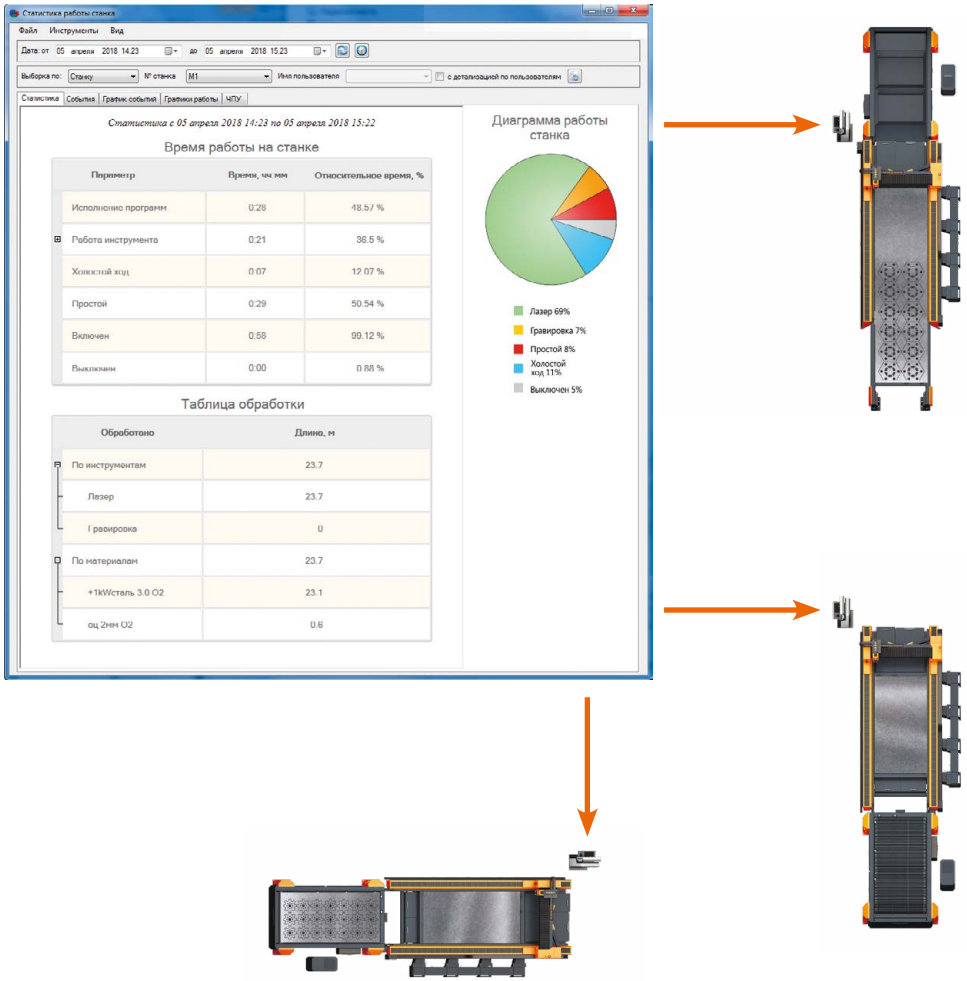


Operator's log

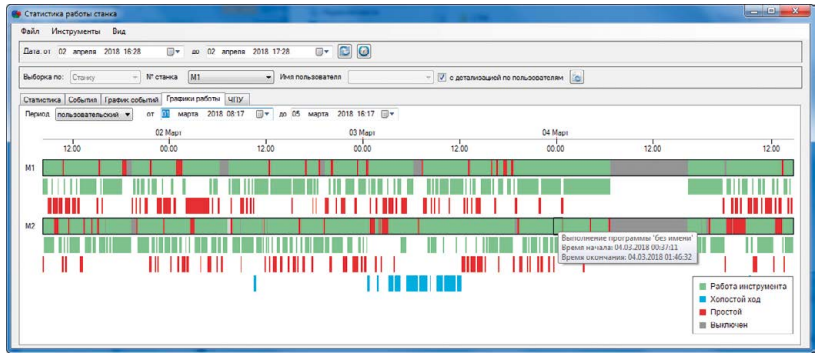
Reduce paperwork!

The system organizes working process more efficiently due to automatic systematization (materials, priority, products).

The module to set and control objectives also allows for balancing the working load among several machines.



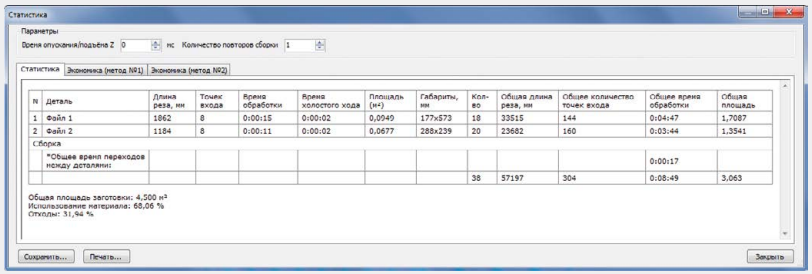
Operator's log also represents the machine's operation statistics: cutting time, free running time, downtime.



Production statistics and economics

UniCut software automatically calculates

- time for workpiece processing,
- beneficial use of materials in percent,
- number of parts,
- cost of one hour cutting,
- cost of one meter cutting,
- cost of one punch for the library materials. Received data significantly simplify cost calculations of separate parts and assemblies, e.g., calculations for third-party orders, costing production and waste.



Service

High quality of the equipment and service is the foundation of Unimach® competitive ability.

Our company designs and manufactures equipment. Along with high qualifications, our engineers have wide actual practical expertise due to their constant work at the manufacturing.

Service 24/7
With 24/7 service support, our customers can be confident that Unimach will provide all necessary assistance at any time.

Warranty and post warranty service
Warranty for all machines and units Unimach® —
24 months not depending on the real machine's operational time

Unimach® manufactures almost 85% of the components and stores all documents to all machines produced by our company. We can assure that you will be provided with spare parts and consumables without regard to the date of production.

Consumables supply
All required consumables are in stock ready for shipment. Place your request and our company will deliver your order within the shortest time.

Remote diagnostics

1. The service centre gets a customer request.
2. With the consent of the customer, our specialist remotely connects to the control console,
3. Makes diagnostics of the troubles and corrects the settings.

This solution minimizes the machine's downtime and cuts down the expenses relating to the troubleshooting.

According to our expertise 80% of cases may be solved remotely

Electronic log book

Electronic log book (customer's account) is a new and convenient online service for Unimach® equipment to check the following information:

- a list of purchased equipment, its specifications and options;
- end of warranty date;
- downloads, such as the certificate, operating manual, maintenance recommendations, catalogue of consumables, etc.;
- a request for service;
- an order of consumables.

Get an access on https://service.unimach.ru/, at any moment from any device connected to the internet.

To receive an access to the log book, contact our service centre

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