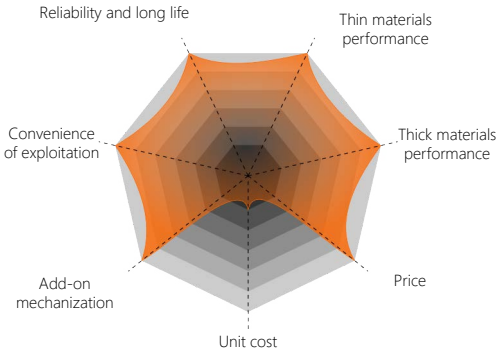


Laser metal processing equipment



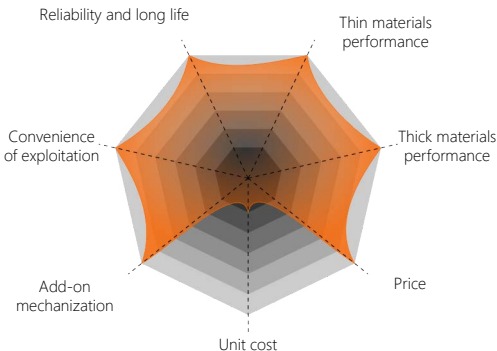
About us 4

LC ULTRA 6



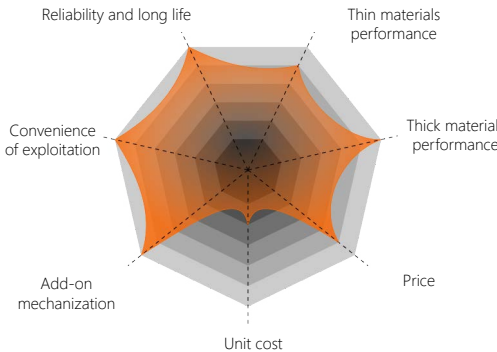
- Unrapalleled performance.
- High level of automation.
- Excellent operational efficiency.
- Wide range of processed materials due to laser power 6-50 kW.

LC EXPERT 8



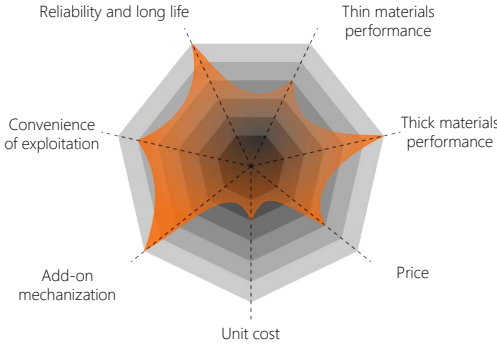
- Unrapalleled performance.
- High level of automation.
- Excellent operational efficiency.
- Wide range of processed materials due to laser power 3-15 kW.

LC PROFESSIONAL M2 10



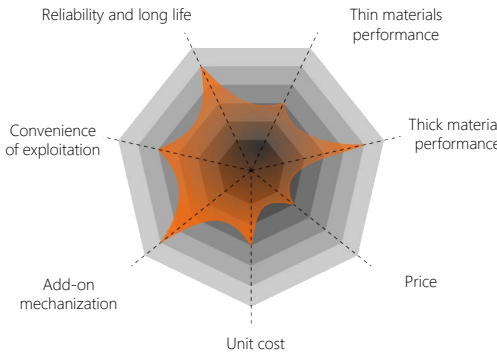
- Perfect combination of high efficiency and affordable price.
- High level of automation.
- Excellent operational efficiency.
- Perfect solution combining laser power up to 10 kW.

LC MASTER 16



- Optimal combination of price, performance and reliability.
- Ideal solution for Small and Medium Enterprise.
- Recommended for application with laser power up to 6 kW.

LC STANDARD 18



- The most affordable pricing.
- Excellent operational parameters paired with laser up to 3 kW.
- Ideal solution for Small Enterprise and microbusiness.

LASERTUBE 20

Machine for automatic cutting of round and shaped tubes.



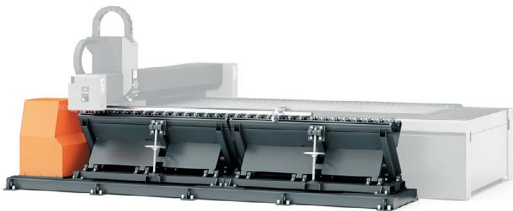
LASERTUBE STANDARD.....22

Machine for figural cutting of round and shaped tubes



Modules for tube cutting.....24

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



LASERWELD26

LaserWeld is a state-of-the-art development which combines high-speed and accurate welding of workpieces with different shape and material and low maintenance costs.



LASERCLEAN.....27

LaserClean – high-performance, reliable and almost maintenance-free machine for laser cleaning of metal workpieces. Compact size and mobility of the machine makes processing of large scale workpieces easier.



AFU-8.....28

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 as well as a part of technological process.



UNIMACH® Features29
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Lean production system. Industry 4.0 ready.....39
Service43



About us

Group of companies NPK Morsvyazavtomatica, based in St Petersburg, designs and produces shipborne and industrial equipment. A motivated team of competent professionals is satisfying customers' needs and provides unique and cost-efficient solutions to the international market.

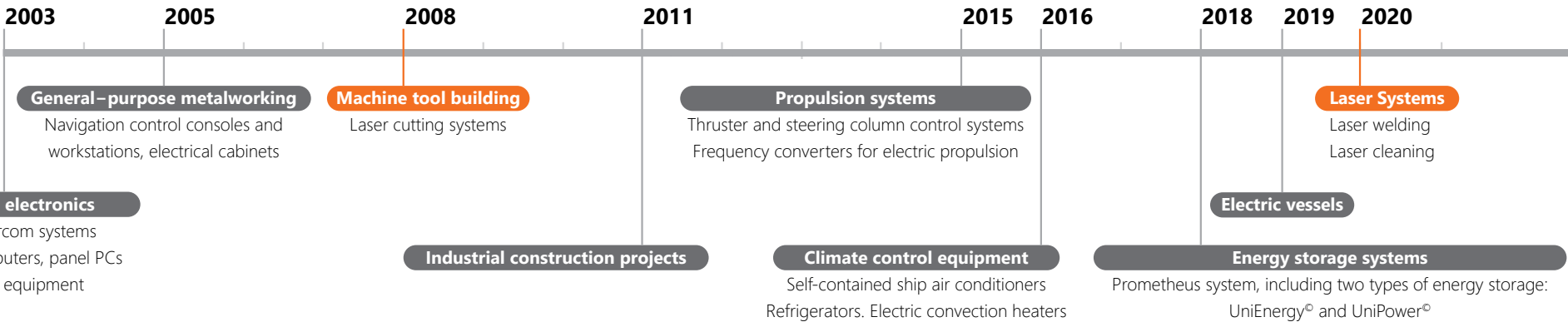
Company's strategy

We take a comprehensive approach to the needs of our customers. Research, design, production, integration into existing operating systems, installation, training, warranty and post-warranty service are in our focus.

Our own R&D, production and service departments enable us to provide a tailored solution for the most complicated tasks within the shortest time.

Our own manufacturing base, vast practical experience in production and value chain approach enable us to provide cost advantages at the highest quality level.

We deliver our production worldwide – it successfully works at industrial facilities, commercial fleet, nuclear icebreakers and polar stations.



We have been manufacturing cutting machines Unimach® since 2006. Since 2010 we have started a continuous production of Professional series, cutting edge laser machines with increased functionality and performance.

Our company pays special attention to the assembly operations at every stage of manufacturing cycle which result in excellent quality of the end production.

Own production base enables us to decrease the manufacturing expenses still maintaining the highest quality

The major part of components – from the machine's bed to electronic assemblies – is manufactured at our production facilities resulting in significant price reduction.

We create an outstanding layout, ergonomics and safety.

We can assure that all necessary components or parts of laser cutting machines Unimach® will be delivered to you within the shortest time.

The equipment's manufacturing is based on practical production and customer's experience. Every day we improve the functionality and quality since we have been intensively operating the machines ourselves.

Our strategy is to control your orders from the design until commissioning works and post warranty service.

Unimach® equipment has a wide range and high level of automated units which allows us to create tailored multifunctional solutions for our customers.

We design and produce our equipment considering real production situation. We do not provide limiting or standardized solutions, bringing innovations and comfort in laser cutting operations. It enables us to integrate laser cutting machines Unimach® into your current production system in full terms.

Our production

- Unimach® Laser cutting machines are optionally equipped with modules for cutting tubes combining sheet and tube processing in one machine.
- Specialized laser machines for cutting shaped tubes are fully automated: from tube loading to ready part unloading.

Our customers:

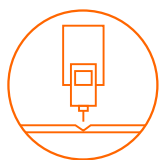
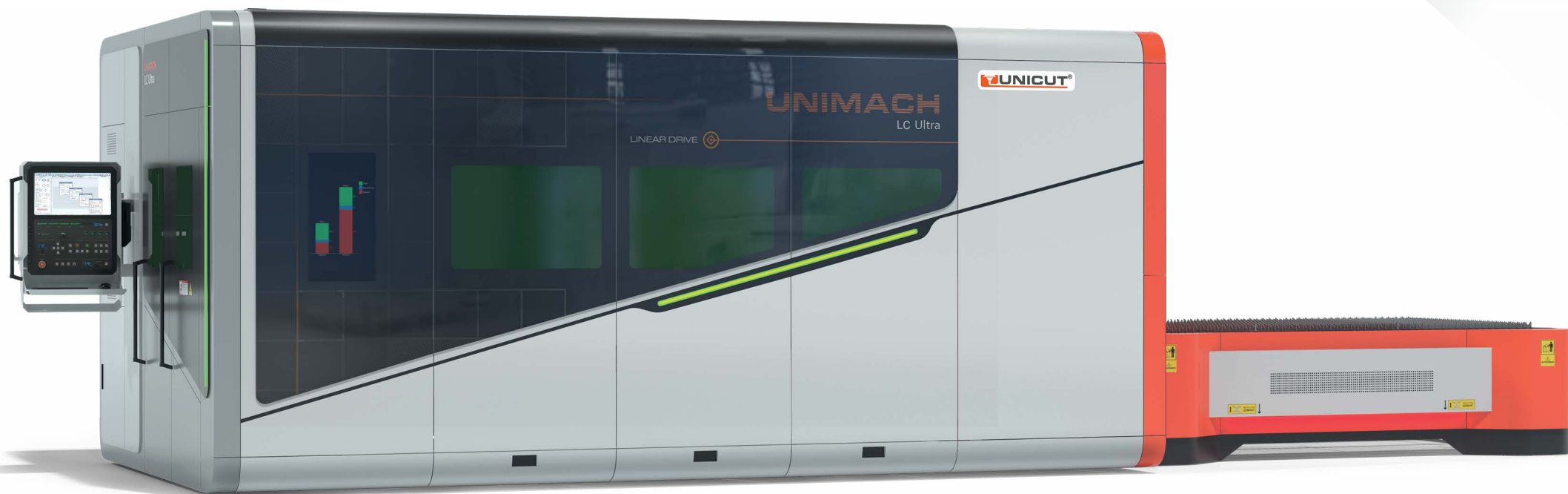
- PAO Severstal
 - Surgutneftegas PJSC
 - FGUP EMZ Rosselkhozakademii
 - JSC "SMC "VIGSTAR"
 - JSC Electroprivyatel
 - Niiem OAO
 - JSC "Kazan Giproniaviaprom"
- and others.



LC ULTRA

Utmost performance
Operational excellence

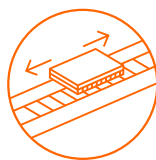
Laser cutting machines of Ultra series outstand Unimach® production line due to the utmost performance. Ultimate power of linear drives paired with high end digital data bus and electronics allows for reaching unprecedented acceleration and deceleration of free movements which result in extreme efficiency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



Laser cutting
head
LH-110
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Focal length
control system
FoCut
p. 35



Linear drive
310 m/min
p. 29



Univision
System
p. 41



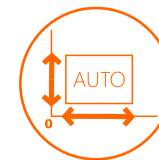
CNC
control
p. 34



Simple integration
into
manufacturing



UniCut
software
p. 36



Automatic measurement
of sheet size and position
on the working table



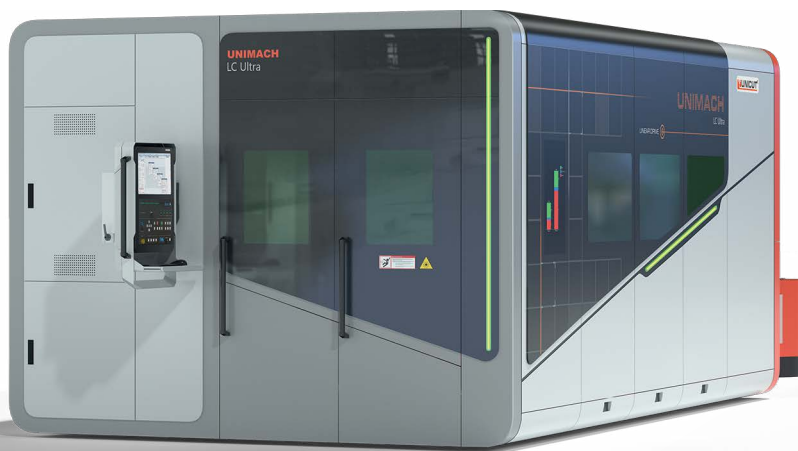
2 year machine
warranty;
3 year laser
warranty

Standard equipment includes:

- Rigid all-welded heat-treated machine bed with subsequent machining
- Gantry coordinate system
- Light-weight composite portal
- High precision guides, integrated feedback
- Linear drive
- Smoke exhaust system with automatic switching of zones
- Ytterbium fiber laser IPG Photonics
- Water / air cooling system (chiller)
- Focal length control system FoCut
- Laser optical head with automatic lens drive LH-110
- 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.)
- Protection 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
- Loading / unloading crane
- Compressor
- Laser protective barrier
- Barcode scanner



Model	Laser	Power (kW)	Overall dimesnions, incl. shuttle table and CNC (LxWxH, mm)	Max. weight (kg)
Ultra	Ytterbium fiber laser IPG Photonics	up to 50	10150x3695x2610	15 500

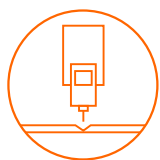
Max. speed	330 m/min
Max. acceleration	5g
Positioning accuracy*	+/-0.05 mm/m

*1 m measurement

LC EXPERT

Utmost performance
Operational excellence

Laser cutting machines of Expert series is a state-of-the-art solution on the metalworking market. Its extreme efficiency meets the needs of Large Enterprise. The wide range of additional automation significantly minimizes downtime of the equipment.



Laser cutting
head
LH-110
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Focal length
control system
FoCut
p. 35



Linear drive
220 m/min
p. 29



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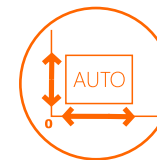
CNC
control
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Simple integration
into
manufacturing



UniCut
software
p. 36



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, integrated feedback
- Linear drive
- Smoke exhaust system with automatic switching of zones
- Ytterbium fiber laser IPG Photonics
- Water / air cooling system (chiller)
- Focal length control system FoCut
- Laser optical head with automatic lens drive LH-110
- 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.)
- Protection 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
- Loading / unloading crane
- Compressor
- Laser protective barrier
- Barcode scanner

Model	Laser	Power (kW)	Overall dimesnions, incl. shuttle table and CNC (LxWxH, mm)	Max. weight (kg)
Expert	Ytterbium fiber laser IPG Photonics	up to 15	9645x3675x2375	13 600

Max. speed	220 m/min
Max. acceleration	3.5g
Positioning accuracy*	+/-0.05 mm/m

*1 m measurement



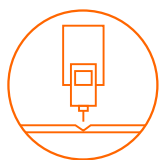
Max. thickness:

- Steel max. 40 mm
- Aluminum max. 24 mm
- Stainless steel, max. 30 mm

LC PROFESSIONAL M2

Performance
Functionality
Reliability

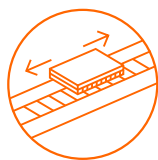
Laser cutting machines LC Professional M2 series based on gantry coordinate system is a high-performance solution for Small & Medium Enterprise.



Laser cutting
head
LH-110
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Focal length
control system
FoCut
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Linear drive
170 m/min
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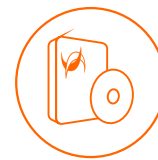
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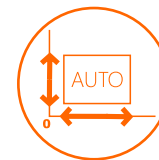
CNC
control
p. 34



Simple integration
into
manufacturing



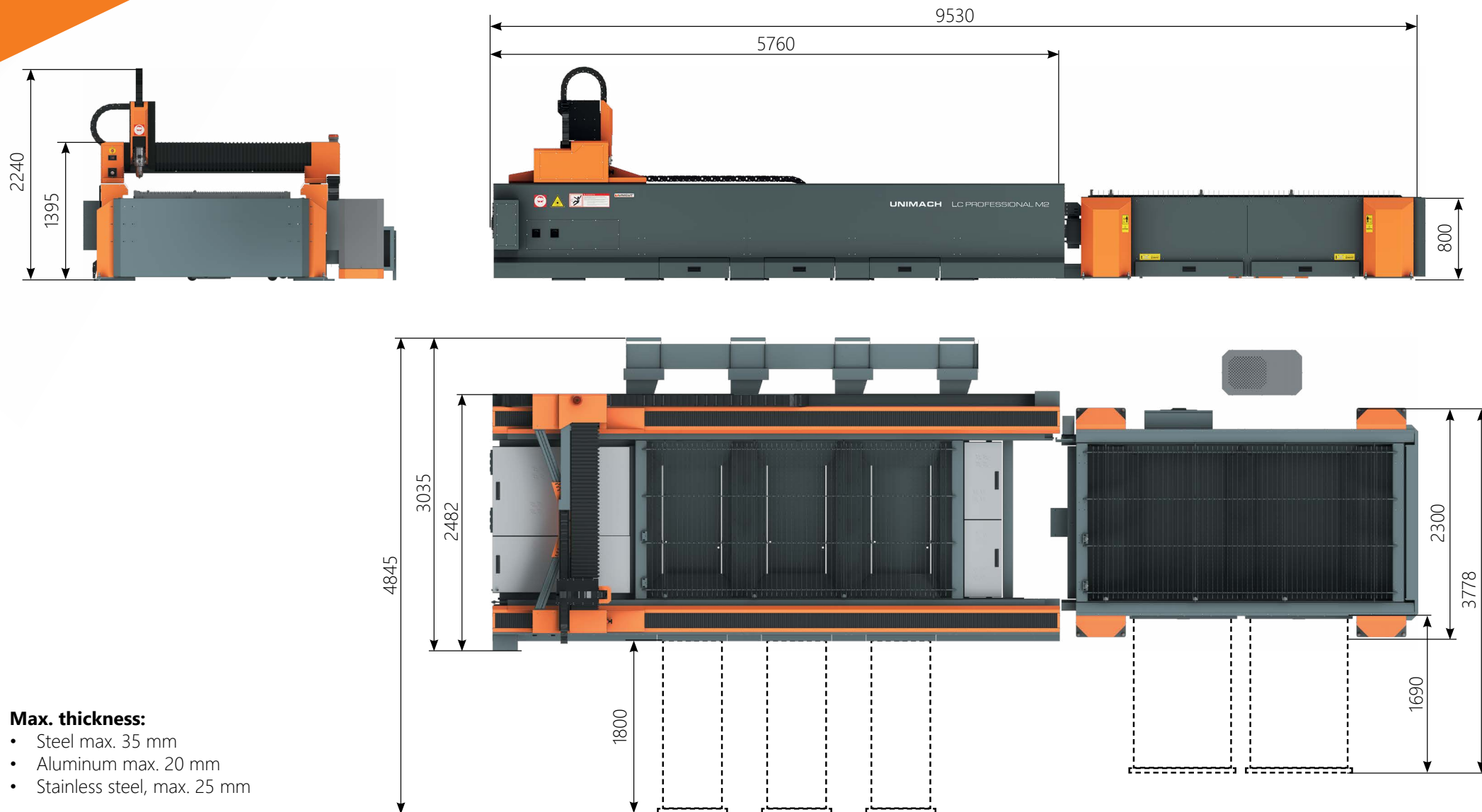
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Automatic measurement
of sheet size and position
on the working table



2 years machine
warranty;
3 years laser
warranty



Max. thickness:

- Steel max. 35 mm
- Aluminum max. 20 mm
- Stainless steel, max. 25 mm

Model	Laser	Power (kW)	Overall dimensions (LxWxH, mm)	Max. weight (kg)
PRF-M2	Ytterbium fiber laser IPG Photonics	up to 10	5760x3055x2240	9000

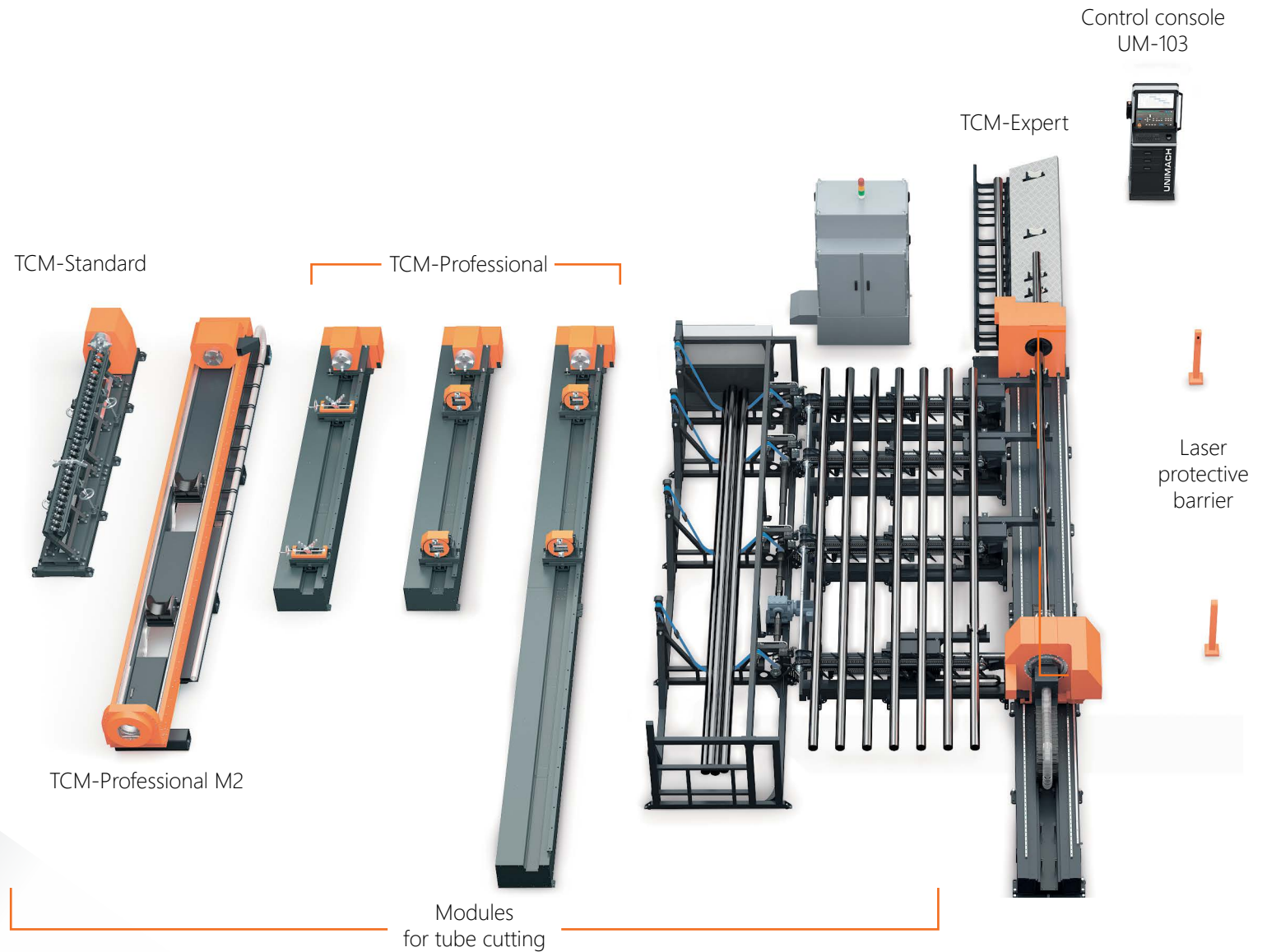
Max. speed	170 m/min
Max. acceleration	3g
Positioning accuracy*	+/-0.05 mm/m

■ The machine with working area 6050x2050 mm is available on request.

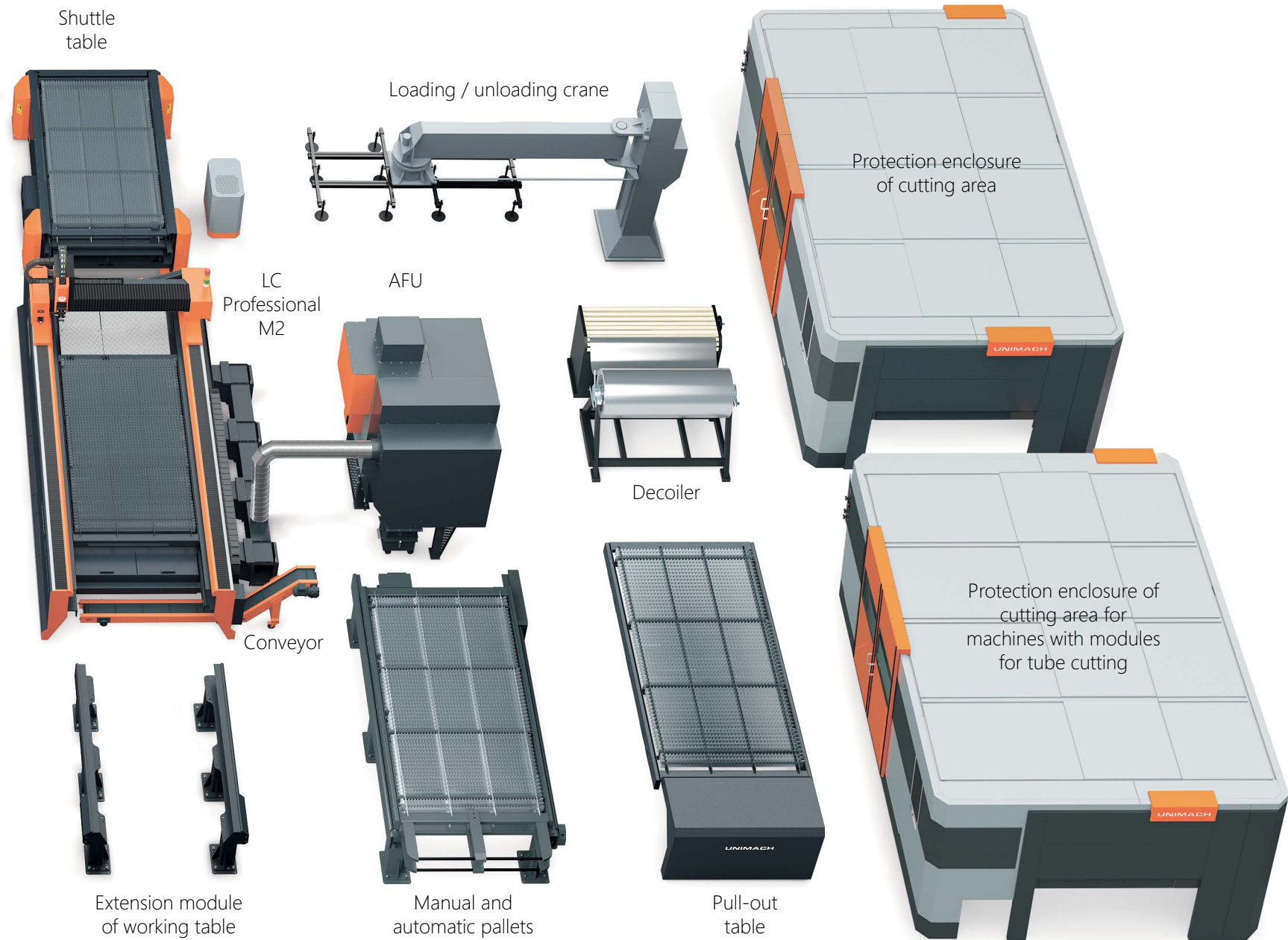
*1 m measurement

AUTOMATION AND FUNCTIONALITY

- Extension module of working table to cut 6-meter sheets
- Protection enclosure
- Manual and automatic pallets
- Shuttle table
- Air filtration unit
- Conveyor line
- Modules for tube cutting (4 models)
- Loading / unloading crane
- Decoiler
- Laser protective barrier



Wide range
of additional modules



**LC PROFESSIONAL M2
with extension module
of working table**

Cut a metal sheet up to 6 meters!

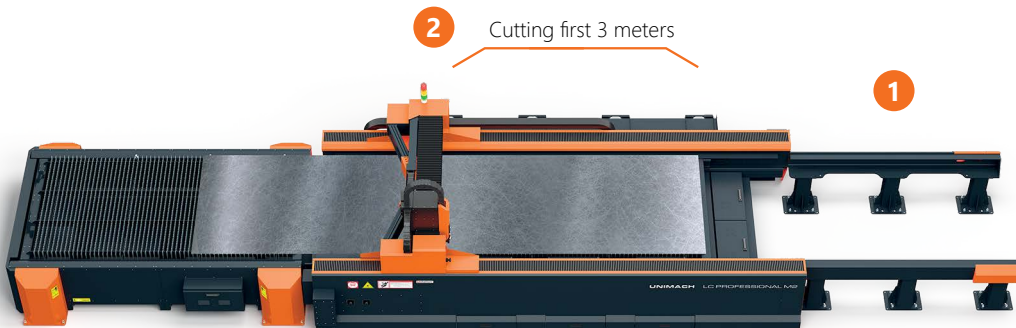
Extension module of working table ensures cutting metal sheets up to 6 meters adding more functionality to the equipment. Automatic movement of working area simplifies production processes and significantly increases efficiency.



Stages of 6 m sheet cutting

Stage 1

1. Extension module of working table is added to standard equipment.
2. Cutting the first part of metal sheet, 3 meter length.



Stage 2

3. Sheet is automatically moved to the extension module of working table.
4. The machine starts cutting the rest 3 meters. Application of high-end technologies allows for maintaining the highest cutting accuracy.



Standard equipment includes:

- Rigid all-welded heat-treated machine bed with subsequent machining
- Gantry coordinate system
- Light-weight composite portal
- High precision guides, integrated feedback
- Linear drive
- Smoke exhaust system with automatic switching of zones
- Ytterbium fiber laser IPG Photonics

- Water / air cooling system (chiller)
- Focal length control system FoCut
- Laser optical head with automatic lens drive LH-110
- Control console UM-103 (IP65, industrial LCD 21", stationary control panel, pull-out keyboard)
- UniCut Software
- 3-gas console

- Remote control panel
- Exhaust fan
- SPTA kit
- Commissioning works and personnel training
- Automatic pull-out pallet

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 safe loading and preventing the machine from possible damage.



Dual-pallet system of metal sheet loading reduces time for workpieces' loading/unloading

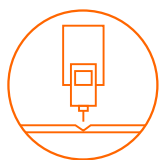
Shuttle table with dual-pallet system ensures metal sheet loading to the cutting area and non-stop machine operation.

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 new sheet is loaded.



LC MASTER

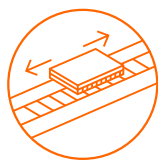
New LC Master series combines high-speed and dynamic linear drive, quick internal digital network, high-end electronics and unparalleled pricing strategy. Another advantage of LC Master is a wide range of automated units such as shuttle (dual-pallet) systems and tube rotators.



Laser cutting
head
LH-110
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Focal length
control system
FoCut
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Linear drive
150 m/min
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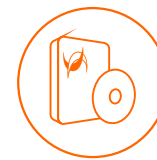
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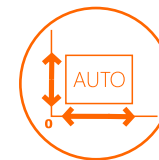
CNC
control
p. 34



Simple integration
into
manufacturing



UniCut
software
p. 36



Automatic measurement
of sheet size and position
on the working table



2 years machine
warranty;
3 years laser
warranty

Excellent dynamics
Unparalleled
pricing strategy

Standard equipment includes:

- Rigid all-welded heat-treated machine bed with subsequent machining
- Gantry coordinate system
- Light-weight composite portal
- High precision linear guides, integrated feedback
- X,Y axes linear drive
- Zoned smoke exhaust system
- Ytterbium fiber laser IPG Photonics
- Water / air cooling system (chiller)
- Focal length control system FoCut
- Laser optical head with automatic lens drive LH-110
- Control console UM-102
- UniCut software
- 3-gas console
- Remote control panel
- Exhaust fan
- SPTA kit
- Commissioning works and personnel training.

Options

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



Model	Laser	Power (kW)	Overall dimensions (LxWxH, mm)	Max. weight (kg)
Master	Ytterbium fiber laser IPG Photonics	up to 6	4320x2515x2110	5200

Max. speed	150 m/min
Max. acceleration	2.5g
Positioning accuracy*	+/-0.05 mm/m

*1 m measurement

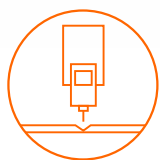
Max. thickness:

- Steel, max. 30 mm
- Aluminum, max. 16 mm
- Stainless steel, max. 20 mm

LC STANDARD

Laser cutting machines LC Standard series – is a high-performance solution for Small & Medium Enterprise and microbusiness. This series comes to the aid when application of linear drive is considered impractical due to speed and efficiency of production.

Our LC Standard machines are equipped with fiber lasers IPG Photonics ensuring high performance and allowing us to solve a wide variety of tasks.



Laser cutting
head
LH-110
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Focal length
control system
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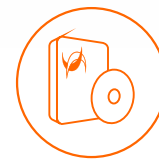
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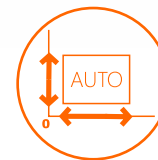
CNC
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Simple integration
into
manufacturing



UniCut
software
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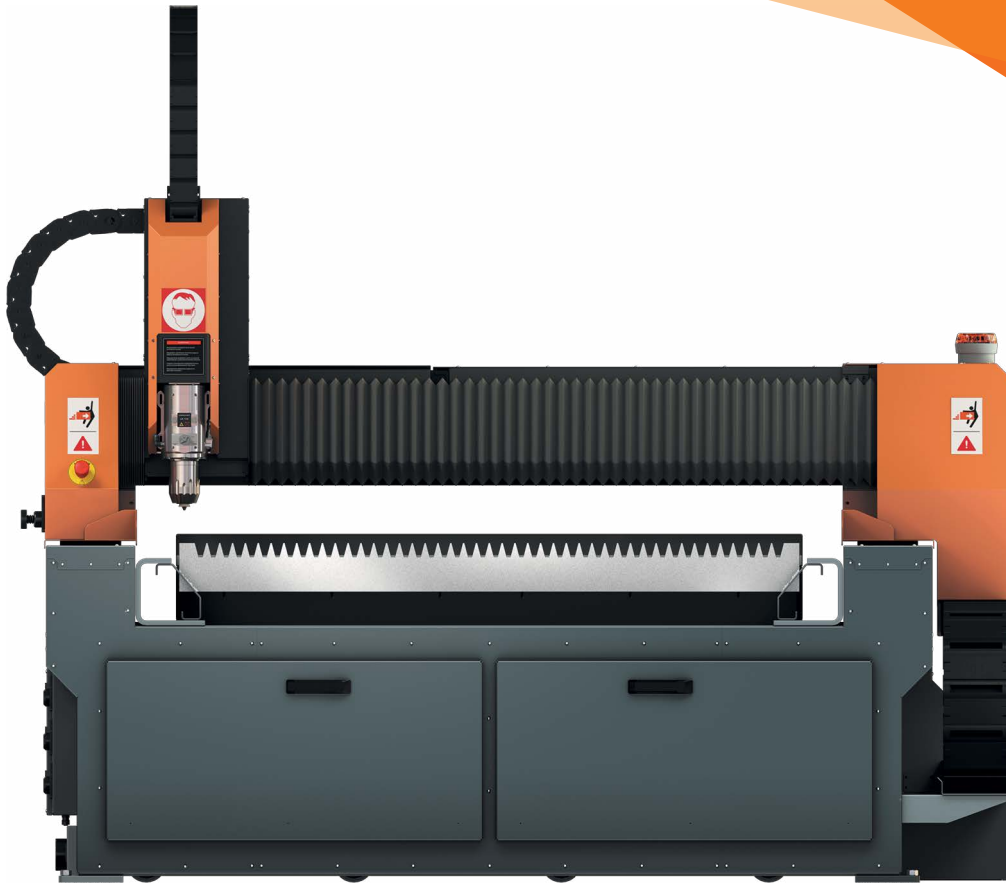


Automatic measurement
of sheet size and position
on the working table



2 years machine
warranty;
3 years laser
warranty

We provide cost-effective solutions



Standard equipment includes:

- Rigid all-welded heat-treated machine bed with subsequent machining
- Gantry coordinate system
- Light-weight composite portal
- High precision linear guides, integrated feedback
- X,Y, Z axes servo drive
- Zoned smoke exhaust system
- Ytterbium fiber laser IPG Photonics
- Water / air cooling system (chiller)
- Focal length control system FoCut
- UniCut software
- 3-gas console
- Laser optical head with automatic lens drive LH-110
- Control console UM-102 (IP65, industrial LCD 21", stationary control panel, pull-out keyboard)
- UniCut software
- 3-gas console
- Remote control panel
- Exhaust fan
- SPTA kit
- Commissioning works and personnel training.

Model	Laser	Power (kW)	Overall dimensions (LxWxH, mm)	Max. weight (kg)
Standard	Ytterbium fiber laser IPG Photonics	up to 3	4380x2610x2135	4200

Max. thickness:

- Steel, max. 20 mm
- Aluminum, max. 12 mm
- Stainless steel, max. 14 mm

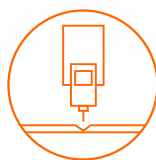
Max. speed	120 m/min
Max. acceleration	2g
Positioning accuracy*	+/-0.1 mm/m

*1 m measurement

Laser cutting tube machine

LASERTUBE

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



Laser cutting
head
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control
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Simple integration
into
manufacturing



UniCut
software
p. 36



2 years machine
warranty;
3 years laser
warranty

Modular design allows
for creating various solutions
depending on the technical
requirements



Available modules:

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

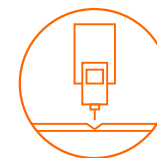
Overall dimensions (LxWxH, mm)	Protective enclosure and tube feed system 11830x5465x2500
Tube outer diameter, mm	20 – 250
Shaped tube size, mm	from 20x20 to 175x175 or cross section shall fit in Ø 250 mm
Tube length, mm	200 – 6300
Laser	Ytterbium fiber laser
Max. power consumption	14.6 kW
Power supply	380 V DC
Axis X	Servo drive with zero backlash gear. Precision rack & pinion
Axis Y	Linear drive, precision measurement scale
Axis Z	Servo drive with zero backlash gear, additional tracking feedback, precision ball screw
Axis R	Linear drive, precision measurement scale

Laser cutting tube machine

LASERTUBE STANDARD

LaserTube STD – is affordable, high-performance and efficient solution for Small & Medium Enterprise. The machine perfectly fits medium production capacities which do not require automatic loading units and tube moving to cutting zone.

Compared to more expensive analogues LaserTube STD has similar features with more affordable pricing. Increased operating range allows for precise cutting of both large-scale, heavy-wall tubes and light, thin-wall ones. Universal easy-adjustable supports along the movement of chuck ensure reliable tube clamping and prevent it from distortion.



Laser cutting
head
LH-110
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CNC
control
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Simple integration
into
manufacturing



UniCut
software
p. 36



2 years machine warranty;
3 years laser warranty



Features:

- Increased cutting precision in clamping zone;
- Automated drive of chuck and steady rest cams;
- Linear drive of steady rest ensures precision rotation and high quality processing;
- Cutting tubes up to 6 meters;
- Universal easy-adjustable supports minimize time to readjust the machine while changing a tube and ensure almost nonstop operation;
- Smoke exhaust system to remove dust, dirt and products of cutting out of tube and working zone.



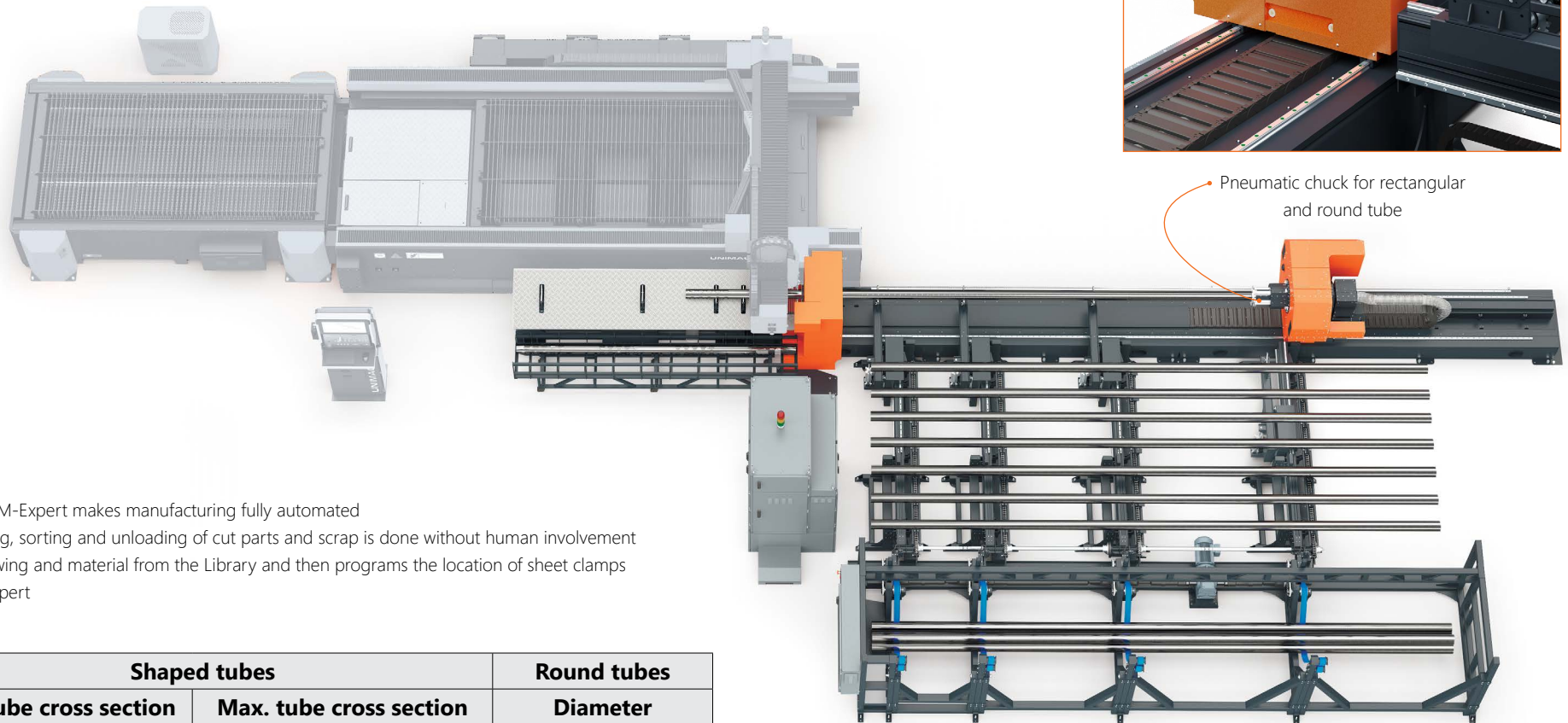
Overall dimensions (LxWxH, mm)	10700x1800x5600
Tube outer diameter, mm	20 – 250
Shaped tube size, mm	from 20x20 to 175x175 or cross section shall fit in Ø 250 mm
Tube length, mm	200-6000
Laser	Ytterbium fiber laser
Max. power consumption	28.5 kW
Power supply	380 V DC
Axis X	Servo drive with zero backlash gear. Precision rack & pinion
Axis Y	Linear drive, precision measurement scale
Axis Z	Servo drive with zero backlash gear, additional tracking feedback, precision ball screw
Axis R	Linear drive & Servo drive

Modules for tube cutting

Unimach® laser cutting machines can be optionally equipped with a module for cutting round and rectangular tubes, combining processing of flat sheets and precision tube cutting. Simple and intuitive change of cutting operations leads to increased efficiency.



Pneumatic chuck for rectangular and round tube



TCM-EXPERT

- Module for tube cutting TCM-Expert makes manufacturing fully automated
- Loading, holding and cutting, sorting and unloading of cut parts and scrap is done without human involvement
- Operator downloads a drawing and material from the Library and then programs the location of sheet clamps
- The rest is done by TCM-Expert

Tube length	Shaped tubes		Round tubes
	Min. tube cross section	Max. tube cross section	Diameter
max. 6000 mm	20x20 mm	max. 175x175 mm or shall fit in Ø 250 mm	20 – 250 mm

TCM-EXPERT is used together with PROFESSIONAL M2, MASTER and STANDARD laser cutting machines.

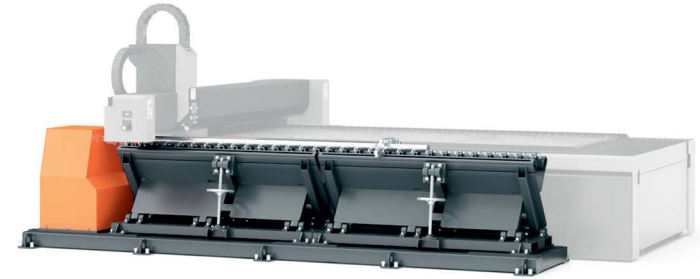
TCM-STANDARD

TCM-Standard is used as a part of laser cutting machines LC Professional M2, LC Master and LC Standard.

Features:

- user-friendly interface;
- high economic efficiency.

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



TCM-PROFESSIONAL

TCM-Professional is used as a part of laser cutting machines LC Professional M2, LC Master and LC Standard.

Features:

- automated cutting processes;
- cutting tube at angle;
- modular design

Round tube diameter	max. 250 mm
Shaped tube cross section	max. 150x150 mm
Tube length	max. 3000 mm
Tube wall thickness	max. 10 mm
Max. tube weight	250 kg



TCM-PROFESSIONAL M2

TCM-Professional M2 is used as a part of laser cutting machines LC Professional M2, LC Standard and LC Master.

Features:

- automated cutting processes;
- cutting tube at angle;
- modular design;
- tube length – max. 6 meters.

Round tube diameter	max. 250 mm
Shaped tube cross section	max. 175x175 mm
Tube length	max. 6000 mm
Tube wall thickness	max. 10 mm
Max. tube weight	600 kg



Pneumatic chuck for rectangular and round tube

Laser welding machine

LASERWELD

Laser welding machine LaserWeld is a state-of-the-art development designed to ensure welding of all types - butt, corner, tee-butt, circumferential, etc. - and parts with poor fit-ups (using wire feeder).

Unlike conventional machines LaserWeld allows for welding workpieces of different thickness and materials which enables to avoid time-consuming and complicated readjustment. Application of fiber laser IPG ensures excellent performance and high quality welds without further processing.

Operating principle

Laser beam is delivered to weld seam by means of mirror optics causing heating, melting and evaporation of particles on the edge. Melted metal fills all defects and micro-roughness creating high density weld.

Point focus paired with its emission length allows for welding in hard-to-reach spots: inside hollows, corrugated structures, etc.

LaserWeld features

- All-purpose machine. Laser welding machine LaserWeld has several modes: loop, dot, line and circle which significantly broadens the range of possible operations.
- The machine is equipped with an automatic wire feeder to weld workpieces with rough edges. Wire is melting, mixing up with welding material and filling roughness and cavities of the workpiece edge.
- Non-standard workpieces. Operations are no longer limited by size of surface. Manual gun allows for welding of long surfaces, hard-to-reach places and angle welding.
- Minimum distortion. Stable and high quality weld. No heating of weld-affected zone.
- High speed. Laser welding is 10 times faster than a conventional arc welding.
- Easy maintenance.
- Minimum amount of consumables.
- High ergonomics. Laser welding machine is easy to operate and readjust when material is changed. It can be also easily moved around the facilities.



Simple integration
into manufacturing

Power*	Wave length	Laser type	Speed	Cooling system	Operating temperature	Humidity	Root gap	Weld thickness	Voltage	Overall dimensions (LxWxH)
1500 W	1060 nm	continuous-wave	120 mm/sec	chiller	15-35°C	<70 %, no condensation	≤0.5 mm	0.5-5 mm	380 V	1132.5x700x1220 mm

*May differ depending on the laser type.

Laser cleaning machine

LASERCLEAN



Simple integration
into manufacturing

LaserClean – is a high performance and efficient laser cleaning machine based on IPG fiber laser. It allows for removing rust, oil spots, paint, oxides, epoxy resins and other contamination from the metal surface.

Non-contact cleaning technology of LaserClean – without any chemicals and surface and cover damage – enables to clean rough surfaces, hard-to-reach places and local zones.

Operating principle

Use of short pulses enables the laser to remove chemical compounds such as rust, dirt, paint coating, etc. leaving the surface clean and ready for further processing. Light pulses are so short that metal surface is not heated and deformed.

LaserClean Features

- Non-contact cleaning. No mechanical impact or damage. No supplementary contamination, sand, dust, etc.
- High accuracy processing. Galvanometric scanner as a part of laser cleaning gun ensures high accuracy of beam positioning. Depending on the technological goals an operator may adjust scanner beam length and width, and control percentage of laser power.
- User-friendly operation. Our machine is easy to operate and does not require time-consuming personnel training. Just set several parameters and select laser power to readjust LaserClean. Save these parameters to use them afterwards as one of available operation modes.
- No consumables. Almost maintenance-free.
- High mobility. Due to convenient design and small weight the machine may be easily moved around the production facilities and operated by one specialist only.



Power	Wave length	Laser type	Capacity*	Cooling system	Operating temperature	Max. scan angle	Horizontal deviation	Vertical deviation	Input aperture	Voltage	Overall dimensions (LxWxH)
500 W	1060 nm	pulse	12 m ² /h	air	15 - 40°C	±15°	12 µrad	8 µrad	9/20 mm	220 V	560x395x1255 mm

* May differ depending on the laser type and material.

Air filtration unit

AFU-8

Efficient air cleaning
and recycling



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 as well as a part of technological process. Two-stage filtering ensures efficient, continuous and quick removal of smoke and dust.

Features:

- Cyclone filter ensures pre-cleaning and removes the main part of clogging which leads to longer life time of filter elements
- Special shape of filter element increases total system efficiency and filter life time
- Low noise level at high efficiency
- Digital inverter drive ensures smooth start, stepless adjustment of suction power and high efficiency
- Electronic controller. The filter-ventilating controller provides a smart measurement of filter clogging and starts cleaning which greatly expands life time of filter elements
- Saving on electricity. Inverter drive with smart control leads to decreased power consumption. Additionally, when the machine is not used at full capacity it switches to the standby mode
- Graphic display with touch control and intuitive interface ensures user-friendly presentation of operational parameters and system notifications
- 99.99% filtration efficiency
- 2 years warranty

Weight	1700 kg
Overall dimensions (WxHxD)	2130x3225x1845 mm
Flange connection	Ø 355 mm
Efficiency	8000 m³/h
Max. air flow	60 l / min (only for filter regeneration cycle)
Power supply	380 V AC, 50 Hz
Max. power consumption	5.6 kW

UNIMACH®

Features

IPG Photonics lasers

Fiber lasers used in Unimach® and produced by «IPG IRE Polus» represent some undeniable advantages compared to other types of lasers.

- Maintenance-free. No contamination, as lasers are located in the entirely sealed body
- Fiber lasers are the most reliable among the existing ones. Their operating lifetime exceeds a decade
- No more consumables. Cut down the expenses on high-skilled service staff
- High quality and stable beam parameters
- Ideal solution for cutting highly-reflecting materials, such as latten, aluminium, copper, galvanized and stainless steel, and making metal engraving

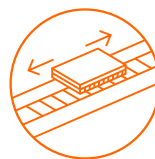
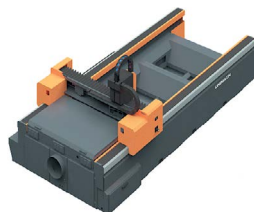


Beam delivery

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

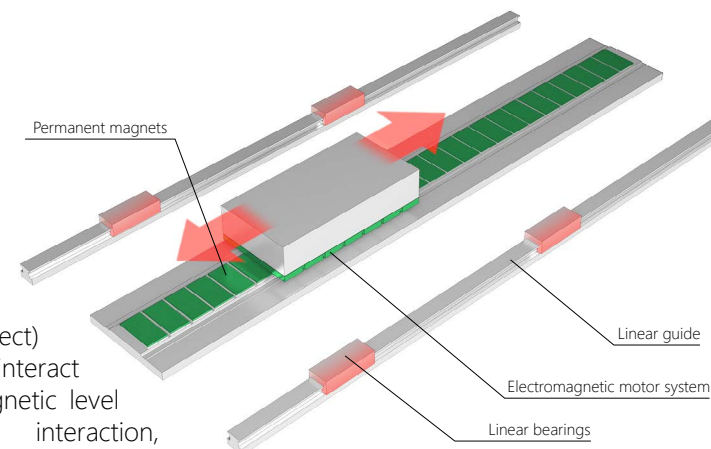
Arrangement and design

We pay special attention to the arrangement and design of the equipment. All parts (laser unit, cooling unit, automation cabinet, etc.) are combined in one complex which leads to saving valuable meters of production facilities, perfect organizing of production operations and increasing reliability of the laser cutting machine. To provide additional comfort all external connections are carried out from one side.



Linear drive

Unimach uses linear (direct) drives. Moving parts interact only at the electromagnetic level excluding mechanical interaction, ensuring high precision, dynamics and speed of movement with no backlash and significantly increasing the machine's performance.



Calibration of coordinate system

Calibration of the coordinate system is made using the laser interferometric measurement system XL-80 and ballbar diagnostics QC-20W by Renishaw. This equipment measures and calibrates parameters with an accuracy of up to the thousandth of one millimeter along the whole working length. Abovementioned systems guarantee the claimed accuracy of coordinate system. Unimach ensures positioning accuracy along the X, Y, Z axes min. ± 0.05 mm / m, repeatable accuracy along the X, Y axes - ± 0.025 mm.



Cooling system

Unimach applies dual-cycle water / air cooling system. It is simple in use, reliable and almost maintenance-free.





Laser cutting head LH-110, p. 31

Laser head LH-110 features automatic lens focusing system, new generation side tracking system and optimized system of cartridge lens replacement.

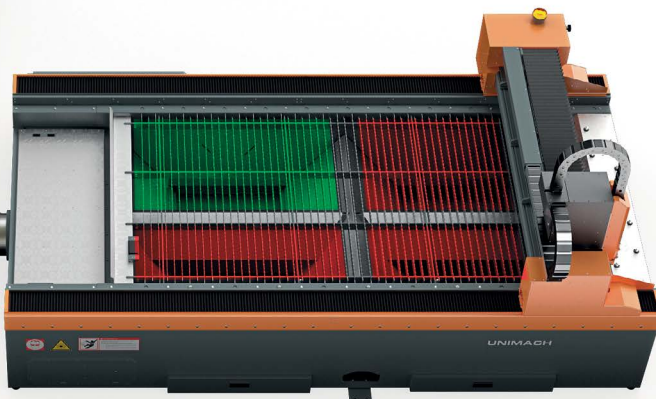
UniCut software, p. 36

UniCut software has been designed by our engineers especially for the metal laser cutting. Large technological expertise paired with detailed awareness of the production chain enabled Unimach specialists to create excellent software product for our machines.



Smoke exhaust system with automatic zone switching

Clean air at your manufacturing! The system switches on only 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.



Gas supply system

It's crucial to ensure that gas blowing of the cutting area maintains the constant pressure during metal cutting (air / oxygen / nitrogen). Unimach® pneumatic system operates with the maximum pressure of 25 atm which is ideal for cutting nonferrous metals and reaching the high quality of cut edge.

Machine bed

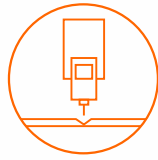
The machine bed is an all-welded heat-treated structure with subsequent machining and polishing. It combines a high accuracy of production, rigidity, reliability and long life. To withstand high dynamic loads the structure is additionally made heavier.

Gears and drives

Ensuring movement of the coordinate system mechanical components and drives are the crucial parts of the machine. Laser cutting machines Unimach® are equipped with reliable mechatronics elements from leading international manufacturers.

Centralized lubrication system

Moving parts of any machine require regular lubrication; they are often covered with protective casings at high quality equipment which is, however, limiting the access. To work this issue out Unimach® has equipped the machines with the centralized lubrication system and maintenance timer. A CNC stand notifies an operator about the time to lubricate machine parts. Dismantling of protective casings is not required, because an operator simply needs to supply a lubricant from the central control panel and confirm it by entering the service password.



Laser cutting head LH-110

Cutting head LH-110 brings automation processes to the next level.

A built-in lens drive ensures automatic adjustment of focal length which lead to simpler settings and higher speed of metal piercing due to displacement of focal point at the moment of piercing. If materials are selected from the Library, the machine automatically makes length adjustments.

Cartridge replacement of lens and protective glass is more simple now!

Using new cartridge replacement of lens and protective glass all you need is to move a clamber, take out a cartridge and put in a new one.



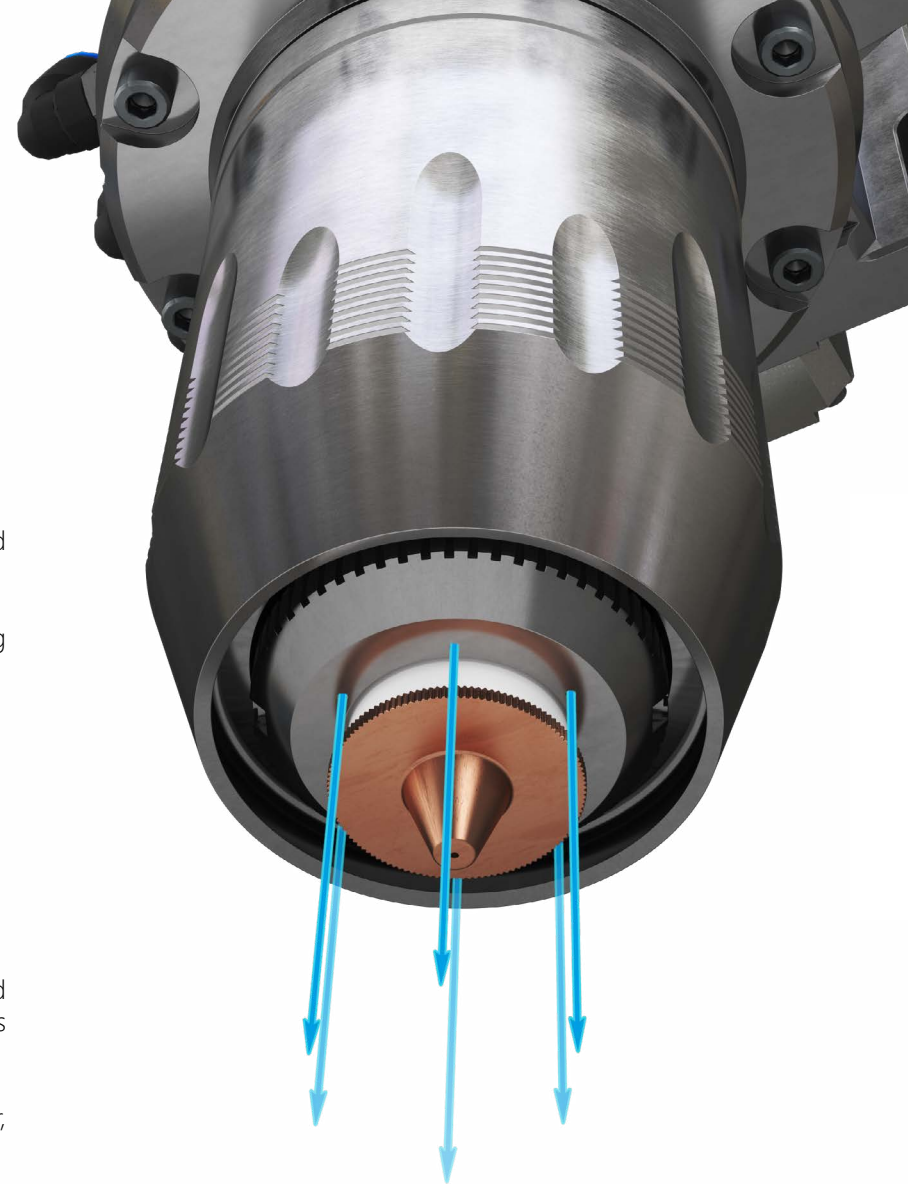


• **Collimator** with an adjustable lens system ensures cutting thicker workpieces, as well as increased speed and quality.

Specifications:

- Collision protection system.
- Forced blowing of piercing point.
- Integrated sensor of focal length control system FoCut.
- Quick (cartridge) change of focus lens.
- Quick (cartridge) change of protection window.
- Adjustment range of focal length: ± 10 mm.
- Change of focal length without stopping (incl. piercing).
- Automatic settings of focus if the materials are selected from the Library.
- Focal lengths 125, 150, 200 mm.
- Collimator with focus lens adjustment allows reaching cutting thicker workpieces, the best quality and higher cutting speed.
- Electric-mechanical lens drive.
- CNC control of focal length.
- Lens diameter 1.25" and 1.5".
- Blowing of protective glass.
- Cooling of cutting area.
- Nozzle temperature control.
- Cooling of nozzle.
- Integrated tracking sensor FoCut
- Integrated control drivers for lens drive
- Z-coordinate controller is connected by digital bus (integrated control of optical head and input data from built-in sensors (4 temperature and 10 photo sensors))
- Beam centering is adjusted in collimator module
- Increased sensitivity of sensors (side tracking – 2 times higher, FoCut system – up to 70 mm height)

• Additional protection system automatically detects hazardous areas (uplifted parts, not included in the safe areas holders, etc.) in real time. If an obstacle is detected the optical head is uplifted, moved to the safe area, or operation is put on hold.



Laser cutting head equipped with air blowing system ensures cleaning and cooling of cutting area.

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

An operator is capable to do the most common operations from any place: start and stop, back travel along the contour, machine and workpiece zero point.



Control panel of the shuttle table

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

Wireless scanner Unimach Cordless Scanner

Application of reliable and convenient Bluetooth barcode scanner increases speed and efficiency of operator's work.

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 machine's CNC automatically downloads relevant cutting programs.

Then, an Operator simply presses the scanner's button. No wasted time searching for necessary files! This solution also excludes the human factor and reduces the possibility of choosing the wrong program.

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

IP rating – IP65.



Control console



All controls – within reach

All controls and LEDs are located in front of the operator at the front panel providing a convenient operating environment.

UniCut soft

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

Protected system

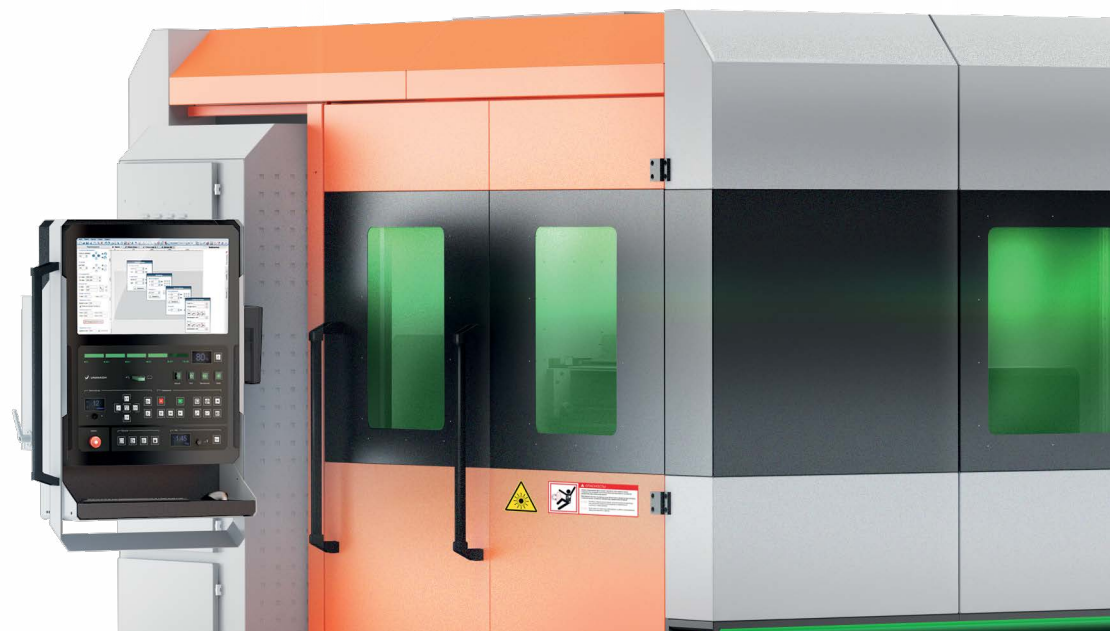
The cutting machine is protected from unauthorized power on/off switching.

Keyboard and mouse

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

Flexible application

The console may be used with or without protection enclosure.





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. High speed of measurement (100 kHz) ensures the shortest response time of the tracking system.

Technical specifications

- Sampling rate: 100 kHz
- Tracking accuracy ± 0.02 mm
- Service upper position of focus lens
- Control of cutting head drive, differential pair A+B (max frequency 500 kHz)
- Lens drive control – digital data line
- 10 MB Digital communication line for cutting head
- 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 1 MHz)

Key features

Pre-heating of the cutting area

Cutting thick material requires pre-heating. An optical head uplifts at the height set by an operator and heats the cutting area; then the optical head goes down and cuts the material.

Shortened height

While moving from one piercing point to another an optical head is not uplifted to the maximum height; it is lifted at the shortened height, therefore saving time and increasing the efficiency of the machine.

Digital collision sensor

The system monitors the optical head's deviation of the 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 uplifts the optical head to the top position.

Digital detection of workpiece edge

The system monitors readings of capacitive sensor and in case the metal suddenly disappears under the nozzle (e.g., when moving over the sheet edge) sends an alarm signal to CNC, and uplifts the cutting head to the upper position.

Jump up piercing

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

Additional collision protection

Additional protection system automatically detects hazardous areas (uplifted parts, not included in the safe areas holders, etc.) in real time. If an obstacle is detected the optical head is uplifted, moved to the safe area, or operation is put on hold.

S-curve acceleration

This function allows for reaching smooth travel speed of the optical head while maintaining the traveling dynamics. S-curve acceleration prevents from occurring self-oscillations while cutting thin materials and removes shock load of the optical head drive.



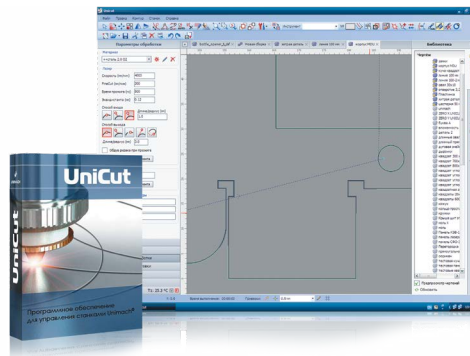
UNICUT software

**UniCut significantly saves time of operator:
once the drawing is uploaded, the cutting
program is created automatically!**

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 allows for 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 initial drawing, etc.



Cutting programs

- Automatic nesting
- «Back movement» and quick transition to any piercing point.
- Own system to upload, store and process cutting programs.
- Imitation of cutting.
- Function which outputs a list of 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)
- Workpiece's parts, which stand out, are shortened (cut) to the required size
- Data base of materials and their technological data
- UniCut automatically compares a workpiece and source file and notifies an operator about any changes. It prevents possible defects in case of modifications and updates of workpieces.
- Remote diagnostics of malfunctions using 3G/4G modem or Internet.

Operation 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 ready drawing, as well as make drawings of new details from scratch using user-friendly tools of automated designing.
- Possibility to read and set microjoints

Uploading time is 60 times less than the CAM system, used by other manufacturers

- UniCut supports DWG, DXF files, G-codes and CL-codes. Once the drawing is uploaded the system automatically creates 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.
- Changes of details can be automatically applied to the whole cutting program due to application of cutting files. In other words, once the detail is changed a user does not have to create new cutting program. The changes will be applied to the rotated and mirrored details.
- Workpiece zooming including all piercing points.
- Application of software features, such as detail multiplication, rotation and mirroring, leads to optimal material consumption.
- Automatic selection 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 parts' nesting

UniCut software includes integrated tools for automatic parts' nesting in the optimal way retaining proper distance among 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.

Automatic program creation

UniCut software can help you to create a cutting program quickly and intuitively, in a few clicks. The program automatically detects 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

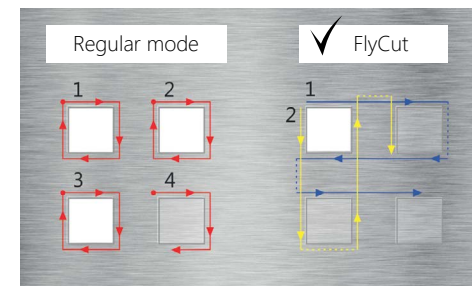
Safe areas – are the areas where clamps or holders are located. If an optical head enters this area, the contour is not processed, and the machine is put on hold. An operator needs to move a holder, provide new settings for safe areas in UniCut and continue cutting operations. Safe areas (mm) are set by an operator; they are also considered when software creates collision-safe travels. ▽

Poor metal quality?
Unimach® has a solution!



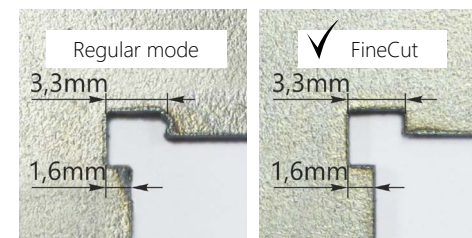
FlyCut

FlyCut is cutting all contours located in one line which significantly reduces time of thin workpieces processing. 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

FineCut processes complicated contours. Specific areas of a contour – at the corners or located 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

Piecing, engraving and cutting modes may be adjusted to ensure highest quality of metal processing. 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.

Automatic switching between the cutting modes

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.

Maintenance timers

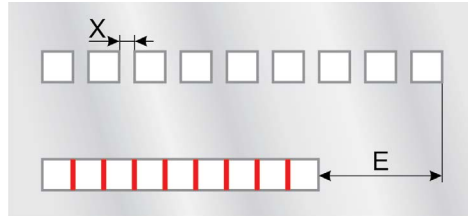
Software maintenance timers help to provide technical maintenance on schedule indicating time for replacing consumables. The software automatically calculates working hours for machine units and notifies an operator about the required service.

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 which were cut out in different modes. Here, $E=8X$.



Automatic calculation of cost

Software automatically calculates a cost of separate parts and all cutting program, cost of cutting hour or meter, or single piercing on the given type of material.

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 for an operator, technician or service engineer. A user gets an access or restriction to change cutting parameters, provide machine's settings, start the 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.

Collision-safe travels

Separate cutout workpieces and parts can be lifted up and become an obstacle on the way of an optical head. Function of collision-safe travels automatically avoids hazardous areas. The movement of an optical head among the contours is controlled by program which prevents it from getting into the areas where the cutting has been already done.

Additional functions

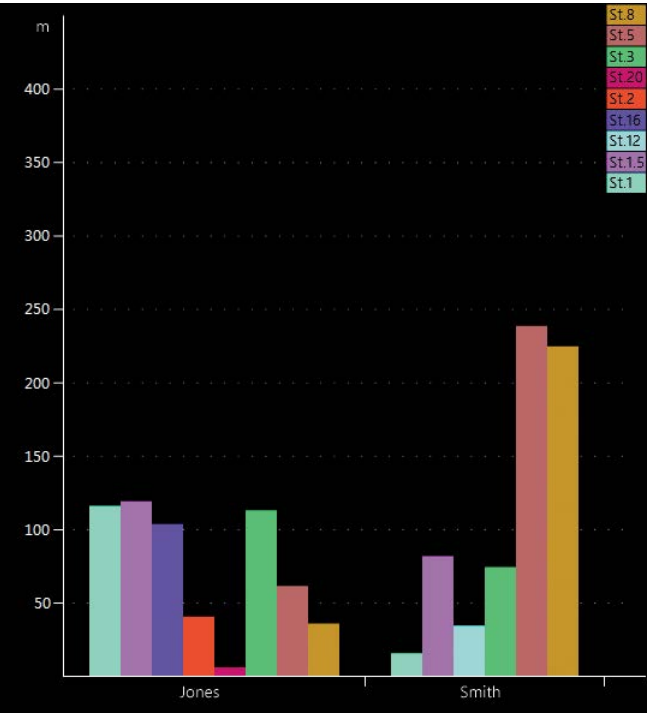
- **Skeleton scrap cutting of inner contours.** UniCut automatically detects contours which can become obstacles on the way of cutting head. It creates a microprogram which cuts an inner contour into smaller ones preventing them from uplift.
- **Extended equipment log.** UniCut software includes additional functions to monitor the operation. 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. UniCut creates a task as a list of cutting programs which are decoded into barcodes. An operator just needs to scan a barcode from the list to download a required cutting program.
- **Engraving a bitmap.** FlyCut function may be used for engraving bitmap images. In this mode laser cutting machine operates as a dot matrix printer, consequently moving with the current speed, switching on / off laser emission at necessary time.
- **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.
- Possibility to **reset all changes to the default values.**
- Evaporative laser cutting allows for processing metal which is 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** which are displayed on the cutting plan.
- **Integration** with production control system Winnum.
- Create programs for cutting square and round tubes. Cycles of workpieces' automatic loading and cut parts' unloading.
- **Hot keys.** In UniCut software the main functions may be accessed using hot keys. Just press a key and create or start a cutting program, free runnings at the preset speed, etc.
- **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 which affect the detail's processing can be changed: bypass parameters, piercing points, equidistants, etc.

Lean production system.

Industry 4.0 ready

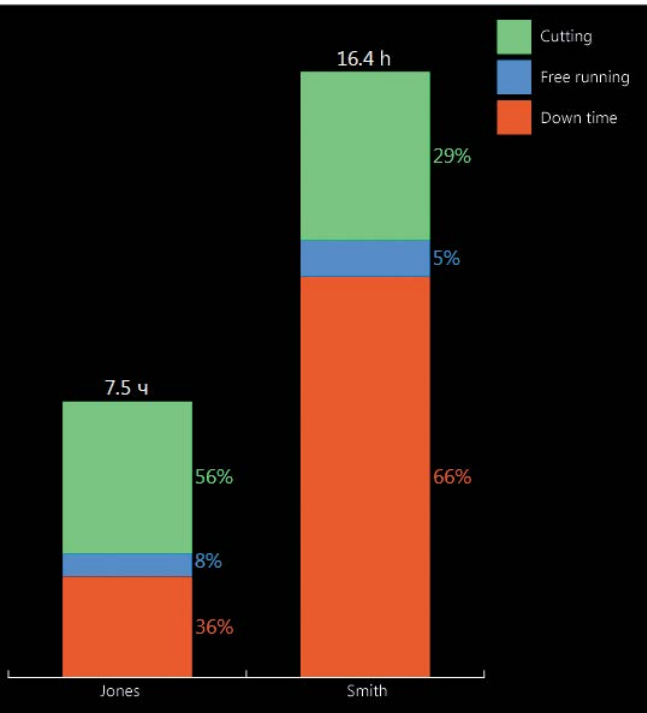
Productivity control UniControl

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



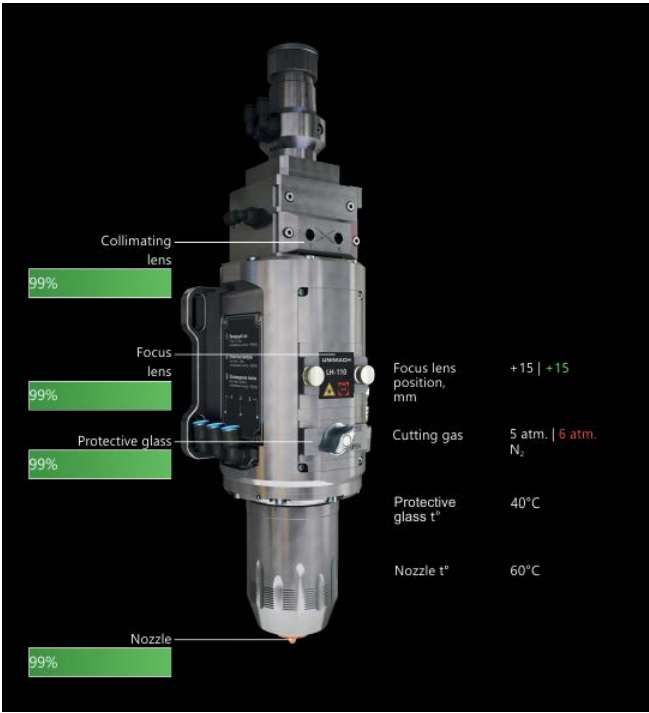
Assortment per employees (2 days)

Graph **Assortment** represents an amount of consumed metal per type and day / shifts / employees, this allows for defining the enterprise's daily or shift efficiency.



Employees' statistics (1 day)

Graph **Employees' statistics** represents total time and work intensity of each operator.



Condition of laser optical head

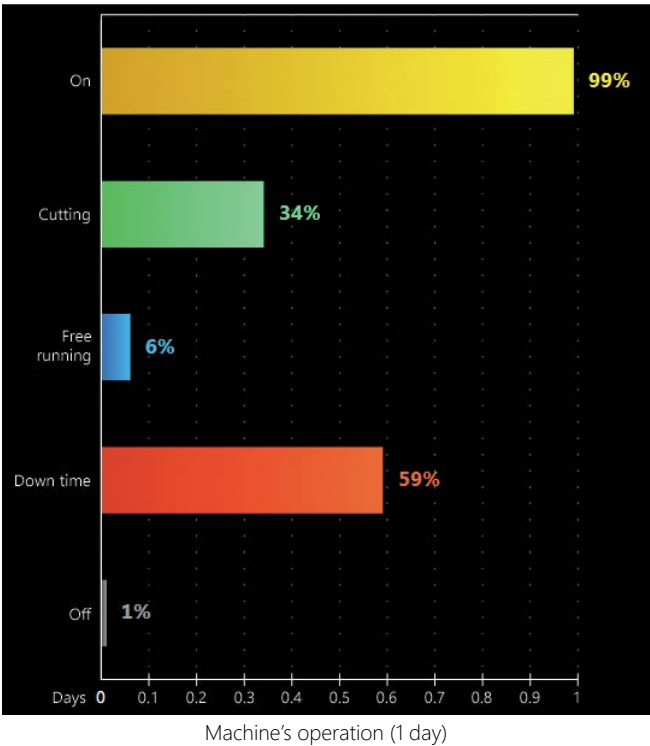
Graph **Condition of laser optical head** represents main parameters of optical head: pressure and cutting gas type; position of focus head; operating temperature of protective glass and nozzle, nozzle standoff. Supply of consumables can be also monitored (supply is almost over or urgent replacement is required).

The productivity control system **UniControl** monitors condition of the equipment and its general efficiency. The system measures and processes production parameters: machine's readiness for operation, metal sheet data and its parameters, metal consumption, production and waste/scrap, warehouse assortment and other.

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

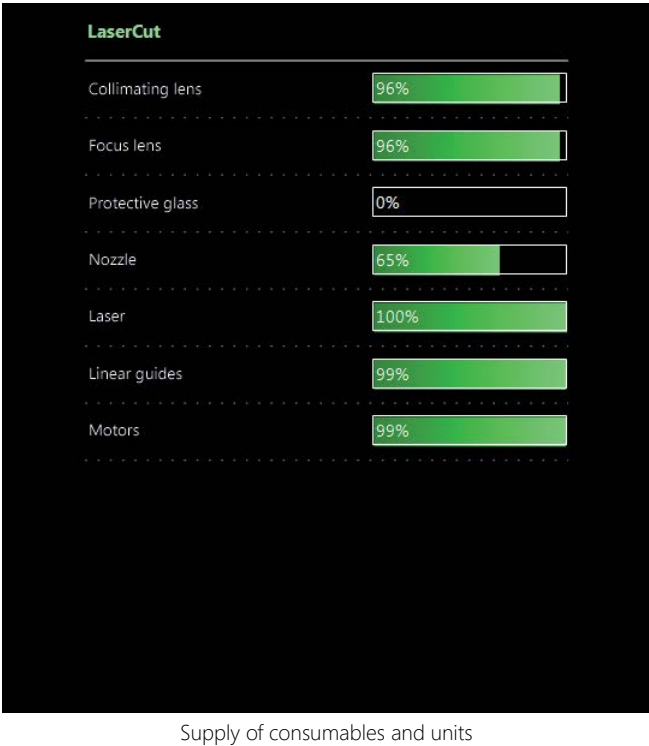
Configurable reports

We develop reports based on any data types in the required format according to customer's needs.



Graph **Machine's operation** displays a percentage of operation modes for the selected time. It represents operation time, down time due to waiting, error or settings. Total time of free running is also displayed.

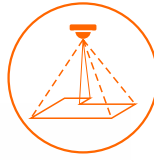
Graph has three types: bar graph (time period), pie chart (for time period), and pie chart representing the last shift.



Graph **Supply of consumables and units** represents the usage limit of consumables and units in percent, and shows the completeness of warehouse with spare parts.



Graph **Process mode deviation** represents recommended and current cutting settings (materials and machine), and deviation percentage.



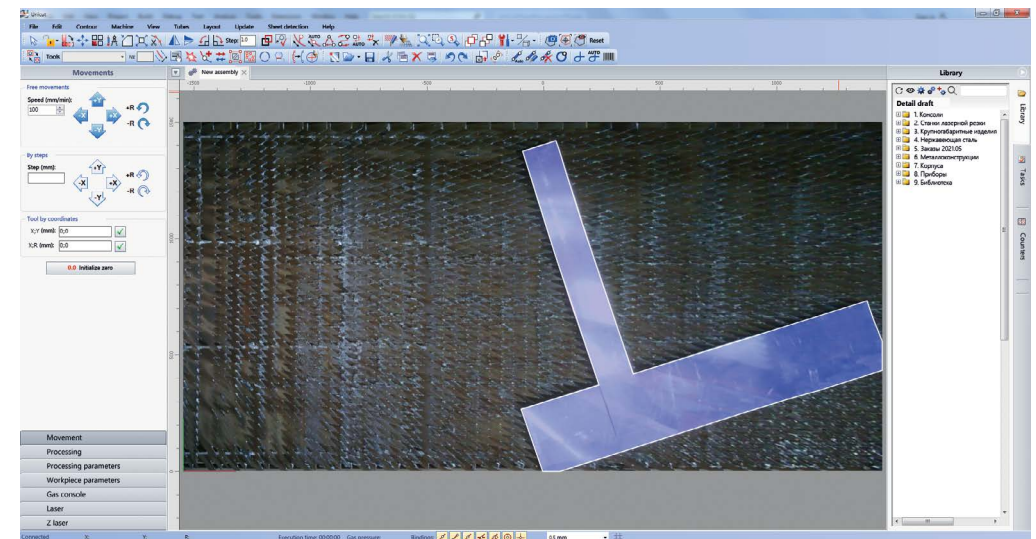
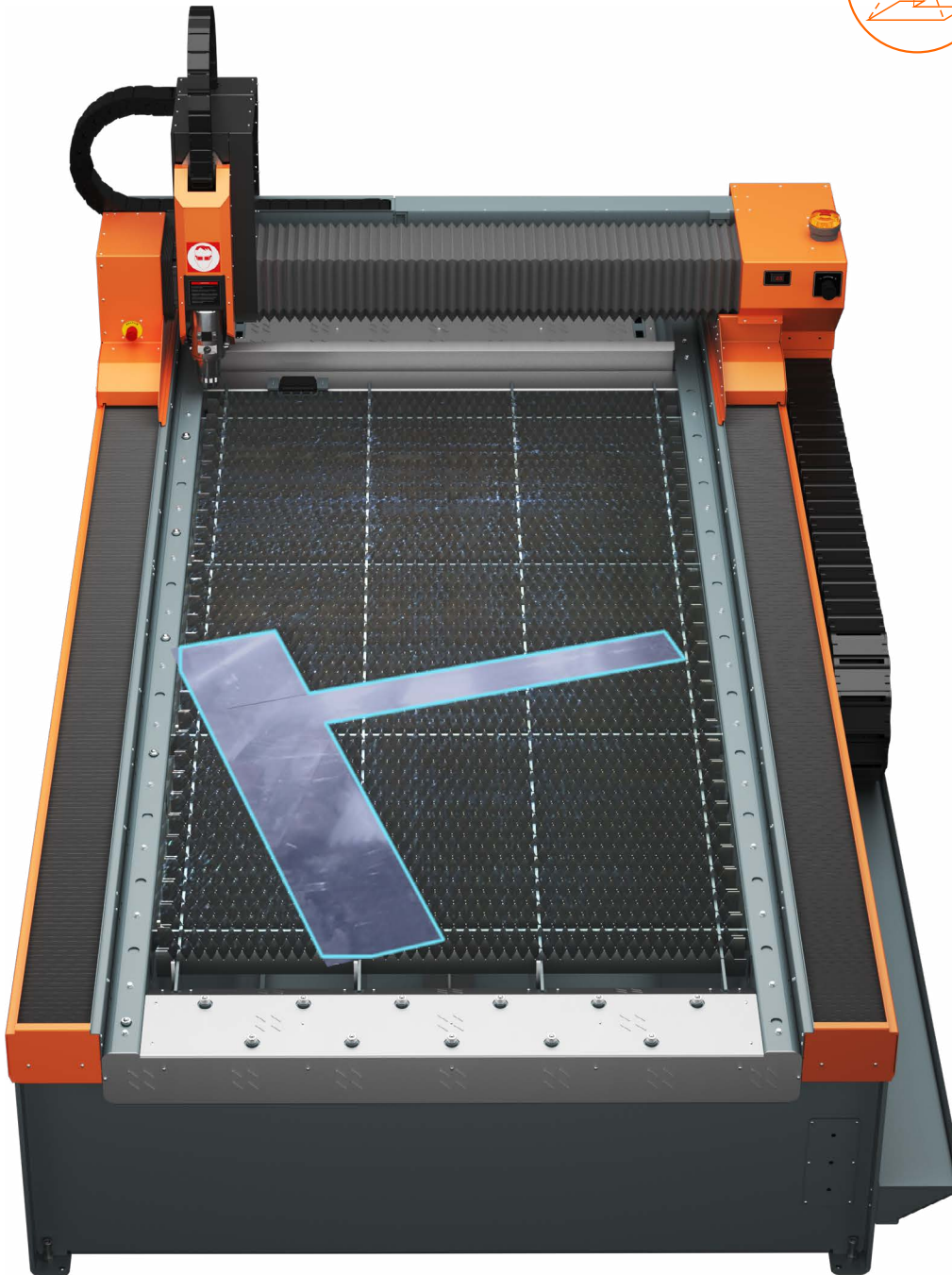
Machine vision system UniVision

UniVision – is an innovation which significantly simplifies and speeds up a process of sheet or workpiece positioning. It allows for reducing the total processing time, cuts down operational expenses and decreases payback time for the equipment.

UniVision system is a digital video camera installed on the laser cutting machine which ensures filming the working area; then a software tool recognizes a workpiece and defines its size, position and shape.

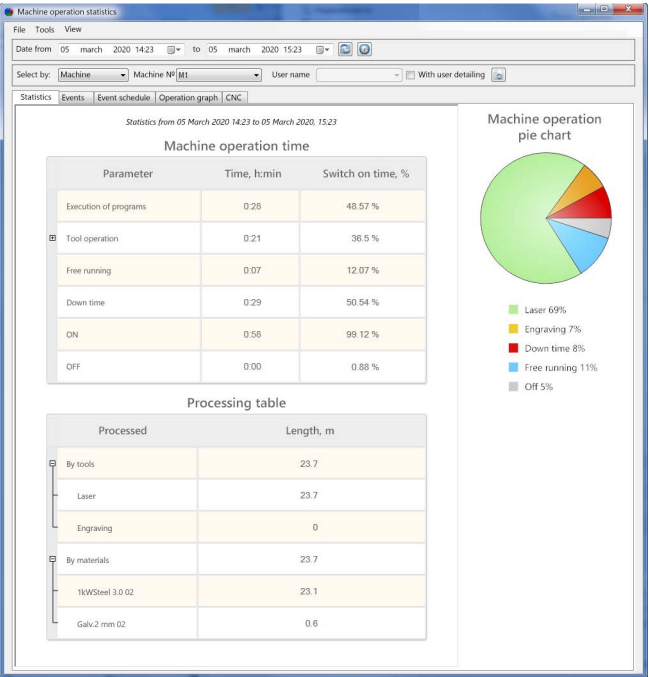
CNC unit automatically references laser coordinate system and the defined workpiece. Recognized contour is displayed on the CNC and operator can position workpieces manually or using an integrated module.

Compared to conventional ways of detection (using a capacity sensor) this system allows for defining a workpiece of a complicated shape. It is also time-saving and reduces the risk of machine damage due to incorrect actions of an operator.

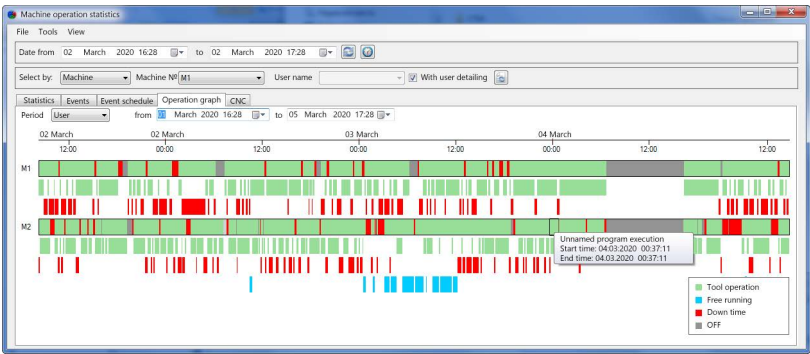


Operator's log

Working objectives can be assigned and controlled through the network from the operator's workplace. This helps to reduce paperwork and organize working process more efficiently due to automatic systematization (materials, priority, product).

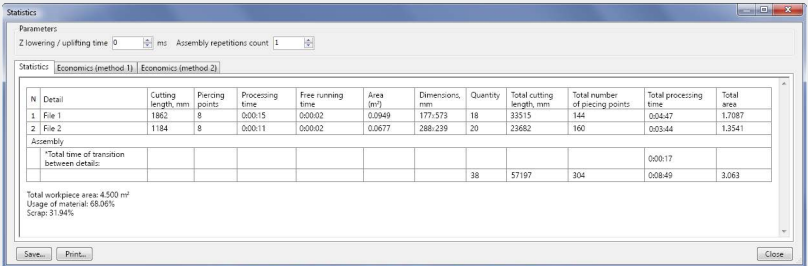


The module to set and control objectives also allows for balancing the working load among several machines. Operator's log also represents the machine's operation statistics: cutting time, free running time, downtime.



Production statistics and economics

For the listed in the Library materials UniCut software automatically calculates time for workpiece processing, beneficial use of materials, number of parts, the cost of one hour or one meter cutting and one punch. Received data significantly simplify cost calculations of separate parts and assemblies, e.g., calculations for third-party orders, costing production and waste.



Service

Our high quality service offers additional benefits to the customers. We created a unique support system to make operation with our machines even more simple and efficient. Unimach® skilled employees are always ready to help you. We provide the service all over Russia.



Warranty and post warranty service

We offer unparalleled conditions of warranty service. Warranty for the machine's fail-free operation is 24 months and **operational life is not limited**.

You can provide cutting 8, 12 or 24 hours a day. Time of warranty doesn't depend on the real machine's operational time.

We can assure that necessary units will not be out of production, since Unimach® manufactures up to **85%** of the machine's elements and components.

Consumables supply

Our company delivers all required consumables and components for the machinery from the parts list according to your request within the shortest time. Place your request by e-mail or phone.



Remote diagnostics

Remote diagnostics – is a key to fast service. As soon as we get a request at our support service, with the consent of the customer we remotely (through the internet) connect to the machine's control console. Our specialists provide the settings' corrections (if any) or diagnostics of the troubles. This solution minimizes the machine's downtime and cuts down the technicians' travel expenses. 80% of cases are solved remotely, without a technician's visit.

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Electronic log book

Electronic log book – is a new service on our website providing every customer with an opportunity to check the following information about the equipment:

- list of the equipment, specifications and options;
- end of warranty date;
- downloads, such as the certificate, operating manual, etc, are available for the particular machine;
- list of repair reports.

Using electronic log book our customers can get an access to data at any moment from any device connected to the internet. Go to <https://service.unimach.ru/> and enter your login and password to log on the system.





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