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EQUIPMENT DESCRIPTION

Purpose

The H. KLEEMANN KS-18BP-1 laser metal cutting process unit with a fiber laser is designed for cutting and marking sheet metal, including coated, according to cutting programs.

Features of the unit

The KS-18BP-1 unit is H.KLEEMANN's own development with advanced X-axis drive technology (Wing system), which is a significant advantage compared to machines with a traditional portal coordinate table design, requiring two synchronized motors to drive the portal along the X-axis, high-precision parallel installation of guides and their reliable protection. The suspended aluminum Y-beam is driven by a single servo motor, drive is located in the upper part of the O-shaped bed in the middle of the Y-beam. There is a patent for the invention.

This design solution provides:

- exclusion of various problems arising in the portal design related to the synchronization of motors and inaccuracy of the portal guide installation;
- high wear resistance of the moving parts of the coordinate table as there is no risk of damage to the guides and motors which are located in the upper part of the bed out of reach of hot metal ejections from the cutting zone.

The Wing system is significantly superior to the portal structure in terms of vibration resistance and is significantly less affected by external sources of vibration (stampers, presses, etc.).

Only high-quality components of the world leaders are used in the production of KS-18BP-1 units:

- precision guides INA (Germany) and TNK (Japan);
- IGUS flexible cable channels (Germany);
- RENISHAW linear encoders (UK);
- DELTA TAU CNC controller (USA), Omron (Japan);
- safety shock absorbers and pneumatic system FESTO (Germany) and CAMOZZI (Italy).



- convenient operation, access to the cutting area is provided from all sides.
- all drive motors and guides are located at the top so that no sparks and waste ever fall on them.

Processing area X/Y	3000/1550 mm
Z-axis stroke	200 mm
X and Y axis positioning accuracy	± 0.1 mm/m
Re-positioning error*	0.05 mm/m
Maximum idle speed in the X/Y plane	110 m/min
Maximum load on the pallet	900 kg
Coordinate table power supply	380VAC(±5%) /3F-50 Hz
Overall dimensions of the unit in basic configuration	9800x2700x2100 mm
Sum of the maximum power consumption of the unit elements	10 kW
Table weight	6 tons

- the architecture with a single motor improves the machine reliability and the service life. The single-motor architecture enables to reduce the size of the machine (compared to a portal machine), which simplifies transportation and reduces commissioning time.
- Changing pallets takes 15 seconds.
- high vibration resistance, dust protection;
- high safety, compliance with environmental standards; high-quality exhaust ventilation system ensures no emissions into the atmosphere while allowing to save electrical and thermal energy on supply ventilation.

Specifications of the equipment

Coordinate table SK-18B

Control system (CNC)

The in-house manufactured CNC in the machines enables working with programs from other laser equipment manufacturers. Advantages of in-house production:

- all processes are controlled, including digital damping of resonant frequencies of the structure;
- remote service is provided;



- availability of continuous stock of components in the warehouse.

Ytterbium fiber laser 1 kw Raycus

Rated output power not less than	1 kW
Radiation wavelength	1070 nm
On/off time (at rated output power)	30 microseconds
Output fiber cable diameter	12 mm
Output beam quality (at the connector output)	Up to 2.5 mm mrad
Supply voltage	360 - 528 V/ 3F-50Hz
Maximum power consumption (at rated output power)	3.6 kW

Chiller LR-0.008

Water cooling temperature	Up to 4°C
Cooling capacity	4 kW
Coolant consumption	120l/min
Coolant pressure	up to 6 bar
K1 tank capacity	240 l
K2 tank capacity	18l
K1 tank capacity	18l
Max. electrical power consumption	3 kW

Control system type	H. KLEMMANN, 17" touch screen, user interface adapted for MS Windows
CNC software	Metalix-H.KLEMMANN
Technological program format	G-code ISO 6983-1
Movement drive control	Direct PWM control (Direct PWM)* or servo amplifier
Interfaces for connecting additional equipment	USB, RS-232, RS-485, EtherNet, Ether Cat, StepDrive
Software:	
Interpolations in the plane	Linear, circular
Linear positioning error compensation	Positioning at a point, non-perpendicularity
Number of offsets	6 pcs.
Number of electrical automation control programs	200 pcs.
RAM	4 GB
Total storage capacity	500 GB
Graphical representation of the tool motion in real time	Implemented
Graphical display of the processing program	Implemented
Control of movement to restricted areas	Preliminary
Collision prevention	During processing
Tool compensation	Implemented
Automatic equipment operation log	Time of execution of a specific program, duration of operation according to the program for the period, list of control programs performed for the period, time of the machine's off state, time of the machine's on state
Control program format	ISO G-code, Fast programming patterns



Operation mode	Round-the-clock
Supply voltage, V (1 phase)	380V/3/50+N+PE*
Control	Automatic

Filter ventilation unit

Capacity, m3/hour.	3600
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Power consumption 5.5 kW.

Power consumption

The average power consumption of the unit is 10 kW (excluding compressors).

Production parameters

Processed metals	carbon steels structural steels stainless steel electrical steels galvanized steel aluminum and alloys copper, titan
Gases used for cutting	Oxygen, air, nitrogen argon (for cutting titanium)
Maximum processed thicknesses*: St3 12X18H10T AMG5 L63	12 mm 4 mm 4 mm 3 mm

* when using high-quality metal, high purity oxygen and setting the appropriate mode, it is possible to cut metals of greater thicknesses.

Basic set of equipment

1	Coordinate table SK-18VR, including: <ul style="list-style-type: none"> • cabinet protection of the cutting zone • drives on the X, Y, Z axes – precision rack-pinion • two replaceable pallets with automatic feeding into the cutting area • Raytools cutting head with automatic focus position control • gas console with automatic control of cutting gas supply • drawers for collecting industrial waste • spare parts kit
2	Metalix-H.KLEEMANN software (basic package with 1 user license)
3	1 kW Ytterbium fiber laser Raycus, including: <ul style="list-style-type: none"> • cooling system (chiller) LR-0.008 • set of cables and hoses
4	Filter ventilation unit
5	Documentation (certificates and operating instructions for equipment)