

STREAMCUT  
WATERJET MACHINE



**KIMLA**

**WATERJET**

# Why...

are the companies working on KIMLA machines...  
so successful?



Our company is unique to this area in Poland. We design and produce efficient and fast CNC machines which are stable and easy to operate. As a company we have achieved the leading position in our industry through our creative projects, effectiveness of action and impressive dynamics of development. Our position has been also complimented by our friendly and respectful attitude towards customers, whose satisfaction and contentment is the primary goal of any project we take on board. We continue to advance by accepting cutting edge projects where our experience of 21 years in the industry prove valuable whilst also thinking outside the box to create and develop new methods and technologies to improve on our solid background platform.

When we first started we were focused on the production of electronics and control systems for CNC machines. However, it quickly became clear that the creativity and potential of our employees and equipment allowed us to tackle more complex projects, so soon we started the production of machines with a much greater technical advancement, exceptional performance and speed.

Currently Kimla machines are offering all the available technological possibilities. Our bespoke machines are the result of our long history in the industry combined with knowledge, experienced staff and strong innovative designs.

As we pride ourselves on being one of the leaders in the industry, having installed more than 2500 machines to customers' companies globally, we are constantly developing and seeking new solutions to customer demands. KIMLA machines achieve industry-leading performance at prices which are significantly lower than those offered by reputable companies elsewhere in the world.

We are continually advancing our CNC technologies and increasing their parameters raising the bar for quality and performance in the industry. This is possible thanks to the expansion of our plants with several new production facilities and information and technology infrastructure.

## Waterjet - innovative cutting technology

Abrasive waterjet technology is the most innovative of all currently available technologies in the cutting technology industry. Waterjet machines can cut practically any material, ranging from very soft ones, such as foams, gels, and sponges, through harder materials classified as plastics, composites, rubber, leather, then soft metals such as aluminium, brass, copper, carbon steel and stainless steel, and ending with heat-resistant and hardened steels, ceramics and cemented carbides. A Waterjet can also cut glass, stone, granite, marble and ceramic tiles which are among the hardest materials encountered in industry. The thicknesses of the materials can reach up to 200 mm, which is an achievement absolutely impossible for the majority of other form-cutting technologies. The advantage of waterjet machines is that the width of the gap left after cutting is very small, less than 1 mm, which allows for the cutting out of extremely complicated shapes and cutting corners precisely.

These machines are used basically in the metal industry, where you need to perform complex cuts on thick metals.

In the stone industry there is a need to cut marble, granite, artificial stones and conglomerates.

Waterjets are also used to cut building components such as stairs, window sills, kitchen or bathroom countertops and elements of tombstones and monuments.

The five-axis versions of the machines that are available allow for the inclination of the head in such a way as enabling cutting with an inclined wall. Five-axis waterjets are used in the metal industry, where chamfering is required for welding. The stream of water (the waterjet) with abrasive components can pierce through the hardest materials from the inside so that it may cut the object closed without the need to enter into the material from the outside as happens when cutting by wire.

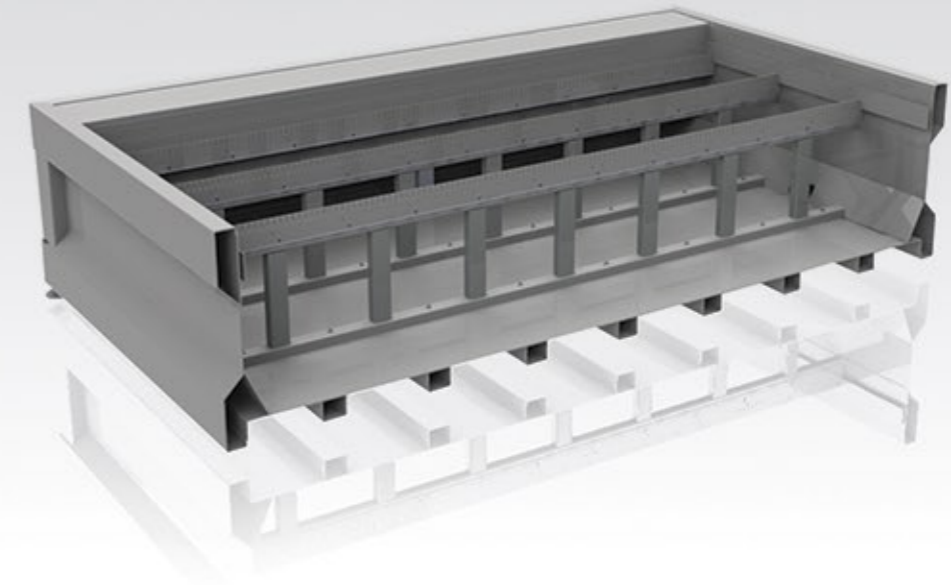
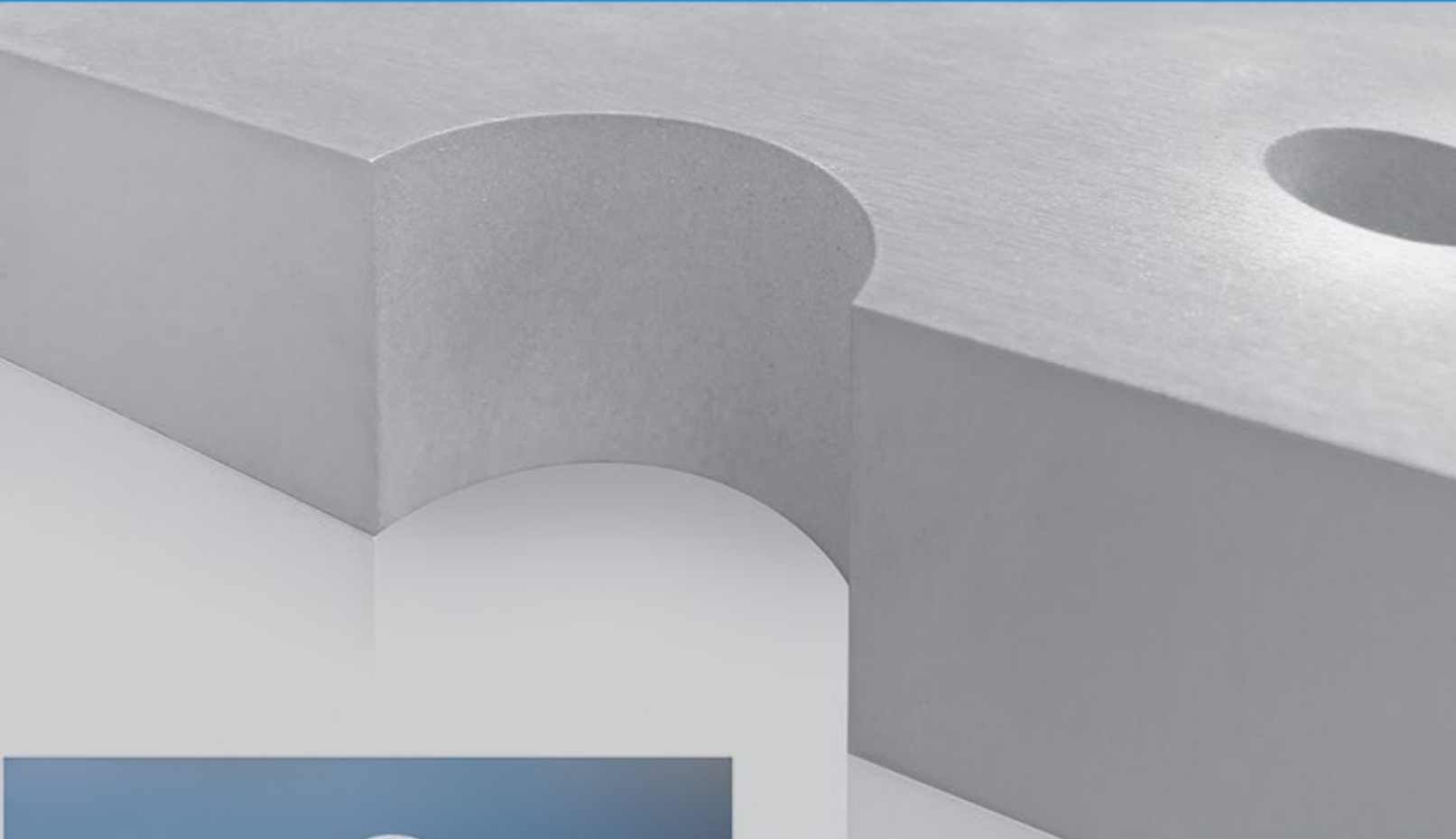
# KIMLA

# WATERJET



# Perfect quality edges, perfect forms

# THE COMPACT CONSTRUCTION OF THE MACHINE MAKES THEM SUITABLE FOR INDUSTRIAL WORKING CONDITIONS



## The rigid spatial construction of the bathtub and the self-supporting structure

The innovative concept of the spatial tub construction, developed by the KIMLA Company, resulted in a very rigid and stable foundation for a modern line of waterjet cutting machines.

It provides not only excellent rigidity and resistance to any deformation caused by the weight of the material and the water pressure, but has also enabled the construction of the self-supporting compact machine of small dimensions. Thanks to this, the machine does not have to be connected to the ground and requires no special foundations.



Low pressure piercing - OFF

## Low pressure piercing

Some materials, such as glass, stone or ceramics are prone to cracking and splintering during piercing. To prevent damage to the material and to provide economical processing of materials, KIMLA machines have been equipped with the possibility of low-pressure piercing, which can reduce the jet impact force during piercing the material.



Low pressure piercing - ON

## Air bag

The innovative use of airbags (displacement chambers) in KIMLA machines reduces the noisy work of waterjet machines. This applies particularly to the movement of the stream of water in air. The water covering a short distance (about 2mm) from the nozzle to the material generates a loud noise. To prevent this, KIMLA waterjet machines are equipped with displacement chambers which enable us to raise the water level for the cutting time and then to lower it in order to remove the material smoothly. This process of raising the water level lasts several seconds and provides for more comfort also by reducing splashing.

## Adjusting the amount of abrasive material

KIMLA machines are equipped with Accustream regulators for the abrasive material which smoothly adjusts the amounts of garnet supplied to the head. This allows for precise dosing of the abrasive, depending on the material being cut and the specific treatment conditions. The possibility of adjusting has a positive impact on the economic aspect by minimizing the consumption of garnet.

## 300kg abrasive tank with hopper system

Abrasive tanks, which are supplied as standard equipment, have a capacity of 200 litres, which enables a single backfilling of 300 kg of garnet. This allows for many hours of cutting without disruption in order to refill with the abrasive. The hopper allows for convenient refilling of abrasive through the use of the mushroom valve lifting up automatically.

## Linear roller bearings with preload

All KIMLA machines have linear bearings by means of the system of rails and rolling blocks with preload. This ensures a high rigidity of the rolling elements and their durability is counted in tens of thousands of kilometres.

## Table made of strips of galvanized steel

To support the material being cut KIMLA waterjet machines have been equipped with a segment grid consisting of long strips of galvanized steel, embedded in comb handles. This allows the installation of ribs at any place on the table, creating more or less concentrated sectors. This ensures their long life and efficient use.

## Adjustable grid

The grid supporting the material requires multiple exchanges and it is important that there is always a possibility of fine adjustment in the height of the ribs. Thanks to this, the gap between the nozzle and the material can be within the optimal range.



## Stainless steel finishing

Some parts of the machine, especially those ones which are exposed to abrasion, are finished with stainless steel. As a result, KIMLA machines maintain an aesthetic appearance for a long time even if they operate in extreme conditions.

## All the drives are protected against water

The water and garnet, which is omnipresent in waterjet machines, could expose the drive elements and linear bearings to mechanical damage and corrosion. To prevent

this, we install covers protecting the drives from direct exposure to sand and water. These solutions guarantee long-term operation of the machine.

## Ergonomics of work

KIMLA waterjet machines are characterized by an extremely compact design requiring little space. The material lying on the grid of the tub can be accessed easily from all four sides of the machine. This allows the operator open access to the material and makes it convenient to collect cut details.

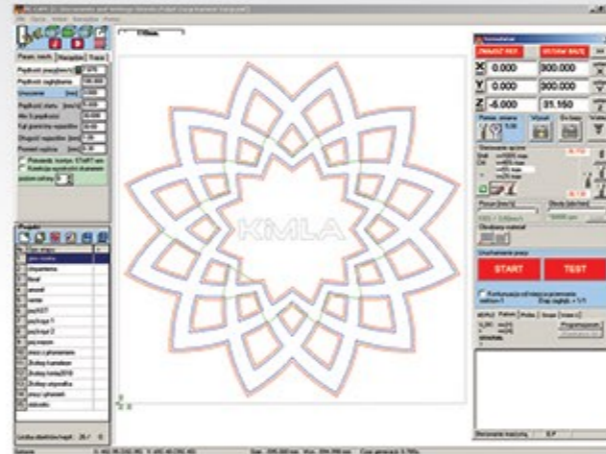
## Waterjet machines - technical parameters:

<b>Waterjet type</b>	Waterjet KIMLA 2111	Waterjet KIMLA 3116	Waterjet KIMLA 3030	Waterjet KIMLA 4121	Waterjet KIMLA 2161
	2100 x 1100	3100 x 1600	3000 x 3000	4100 x 2100	2100 x 6100
<b>Working range (Dimensions of the cut sheet)</b>	Waterjet KIMLA 2661	Waterjet KIMLA 3161	Waterjet KIMLA 21121	Waterjet KIMLA 26121	Waterjet KIMLA 31121
	2600 x 6100	3100 x 6100	2100 x 12100	2600 x 12100	3100 x 12100
<b>Maximum cutting thickness</b>	200 mm				
<b>Pump type</b>	Intensifier pump with ceramic plungers (Very durable)				
<b>Pump power</b>	30HP (22kW), 50HP (37kW), 75HP (56kW), 100HP (74kW)				
<b>Maximum pump pressure</b>	4150 bar				
<b>Pressure expanding system of the pump</b>	Reducing the pressure on the move and after switching the pump off				
<b>Cutting head drive</b>	AC Servo with digital encoders				
<b>X i Y axes drive</b>	AC Servo, no backlash helical drive Güdel - Switzerland				
<b>Z axes drive</b>	AC Servo, ball screw				
<b>Maximum running speed: oś X,Y,Z</b>	54 m/min				
<b>Range of motion in Z axis</b>	200, 250, 300mm, others for request				
<b>Allowable load on the table</b>	15 kN/m <sup>2</sup>				
<b>Tub</b>	3D multi-chamber design with a very high stiffness				
<b>Positioning resolution</b>	0,001 mm				
<b>Abrasive grain size</b>	80-200 mesh				
<b>Abrasive feeder tank</b>	300 kg				
<b>Abrasive delivery system</b>	Pneumatic				
<b>Height adjustment</b>	Automatic				

# INNOVATIVE AND AUTHOR'S CONTROL SYSTEM CUSTOMIZED TO THE NEEDS OF OUR CLIENTS

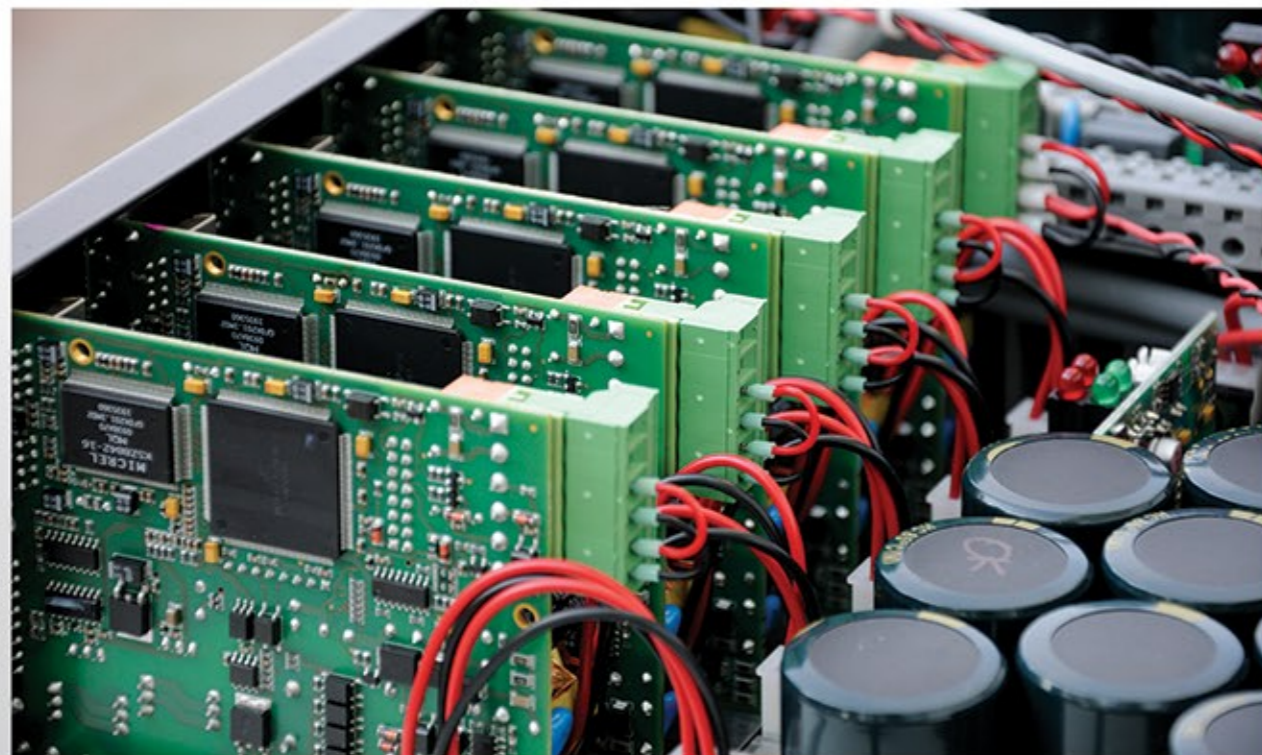
## Toolpath generating software

The dynamic control of the operating speed in waterjet machines is extremely vital. The speed should depend on the shape of the toolpath. KIMLA machines' software has the ability to generate toolpaths automatically on the basis of dxf, plt files, etc., and enables the drawing of elements in the built-in editor. The Toolpath generating module automatically generates the toolpath taking into account the dynamics of the speed and the diameter of the cutting jet. It is extremely important because in many machines from other manufacturers, particularly cheap ones (e.g. Chinese ones), the producers are trying to use mill control systems in their machines, which forces operating with lower speeds for a given shape. The efficiency of this solution is much lower than in the case of KIMLA machines and other leading manufacturers of waterjet machines.



## Digital AC Servo Drives

KIMLA waterjet machines are equipped with modern AC servo drives with the vector control and position feedback to control the position of the head continuously. This enables reliable and repeatable mapping of the machined shape. This control system applied with the dynamic analysis of vectors allows multiple increases in the treatment dynamics, which is especially important when cutting complex shapes.



## RTE Interpolator

KIMLA machines have been equipped with regulators which set the position, speed, torque and the spurt concurrently which is possible thanks to very fast data transmission between the interpolator and servo drives using real-time Ethernet (RTE). As a result, the dynamic accuracy of the machines has significantly increased, which is particularly evident at high speeds and with complex shapes.

## Smooth regulation of the cutting speed

The feed speed during cutting with waterjet machines depends on the type of material, its thickness and the quality which we want to achieve. KIMLA machines enable smooth regulation of the feed speed, which allows the operator to adjust the speed to the specific requirements of the treatment required.

## Operating speeds and accelerations

Most users of waterjet machines are convinced that these machines are slow and do not develop high-speed machining. However, the speed of waterjet technology development is high enough that it is necessary to verify this claim. Thin and relatively soft materials, such as aluminium, ceramics, etc. can be cut much faster than a few years ago. For this reason, the cutting speed limit does not often result from the waterjet technology itself but from the restrictions arising from the capabilities of the control system and the drives. Therefore, the KIMLA machines are equipped with solutions allowing them to achieve an operating speed up to 0.9m/s. This leads to the opportunity of even multiple increase in cutting efficiency, especially for thin materials.

## Electronic gate angle correction

The KIMLA Company has developed and implemented the electronic system for correcting the angle of the gate, which automatically sets the correct angle regardless of the initial setting of the drives. This has enabled the use of the gate moving along the narrower side of the workspace, which significantly increases convenient operation. Additionally, this system provides the correct mapping of the shapes of the details cut, which eliminates errors in the machine positioning.

## Convenient movable control panel

KIMLA machines are equipped with a mobile control panel which can be moved within a range of several meters. This enables the convenient control of the machine.



## HIGHEST QUALITY PUMP WITH MODERN AND DURABLE CONSTRUCTION



### Parameters recorder and remote diagnostics via the Internet

Meeting the expectations of our customers, the KIMLA Company has introduced the function of remote diagnostics via the Internet into its control system. The built-in diagnostics module allows the registration of the machine parameters and system variables in the real time. This enables the visualization of data generated as graphs, which greatly facilitates the analysis of the results. This solution allows for quick and effective diagnosing of all the issues and saves operating time.



### Nesting

The software for optimal distribution is designed for automatic distributing different details by moving and rotating them in an optimum way for the optimum use of the material. Depending on the user requirements there are two versions of the system to achieve varying degrees of optimization. After selecting shapes and their quantities to be cut the user gives the size of the workpiece and the software automatically distributes the details on the sheet.



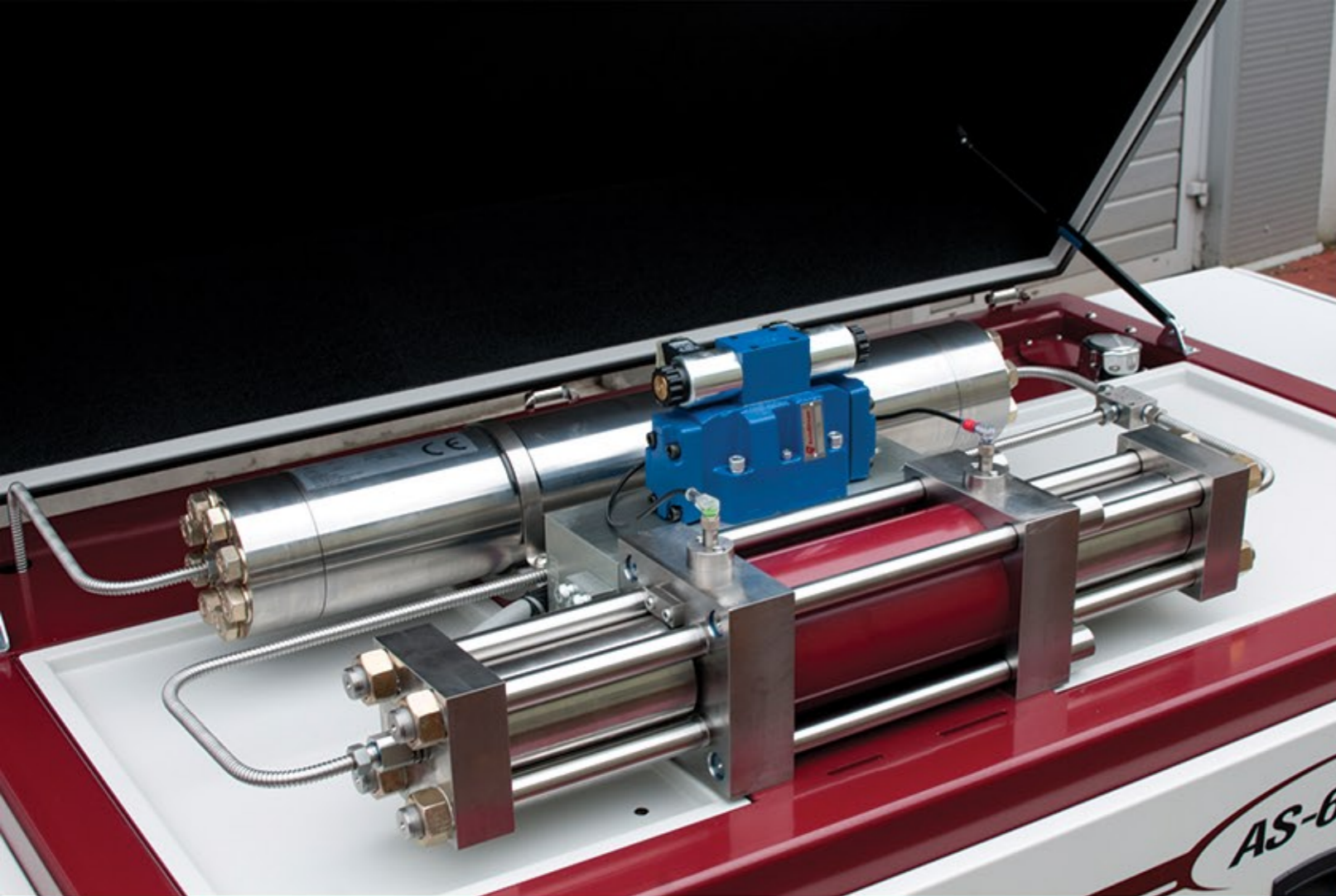
### Possibility of upgrades

The control systems of the CNC machines are ageing (essentially) much faster than their mechanics due to the rapid developments in the field of IT. The control system of a machine is often outdated within a few years. Due to the rapid development of the control system, our company has integrated the module for updating the control system software in our machines. We also offer the exchange of entire control systems at very attractive prices for our regular customers.



### Properties of the intensifier pump:

- a modern pressure intensifier with symmetrical seals in high pressure cylinders, which reduces the range of components while replacing seals,
- non-threaded cylinders fitted with pins,
- ceramic pistons - as standard,
- performance - 4.16 l/min, allowing cutting using tubes up to 1.02 mm,
- no water intake before the machine is started,
- low pressure piercing function,
- remote or local control,
- easy access to all parts during maintenance or repair



### The lowest maintenance costs for the pump head

KIMLA waterjet machines are equipped with high-pressure pumps with pressure intensifiers and Accustream (a renowned American company) accessories. Accustream pumps are distinguished by the lowest maintenance costs, which significantly increases the profitability of investments. This is very important because the maintenance costs of pumps made by other manufacturers are many times higher. It is of vital importance when the operating costs can determine the success of the project in the competitive market for waterjet cutting.

### Independent, external cooling system

The pump is equipped with an external cooling system of oil operating in a closed circuit, which significantly reduces the use of water that is consumed only for the cutting process. This allows the heat exchanger to be moved outside, which reduces the space requirement and the noise. There is also the possibility to recover energy from the refrigeration system for heating purposes.

### 4.1 l/min at 50HP and 4150 bar

Most 50HP pumps with a pressure of 4150 bar have a consumption of 3.8l. By applying modern construction to the oil vane pump with adjustable pressure and variable flow, Accustream pumps have reached a consumption of 4.16 l/min at 50 hp, while increasing the energy efficiency of the pump.

### Modern pressure amplifier with symmetrical seals

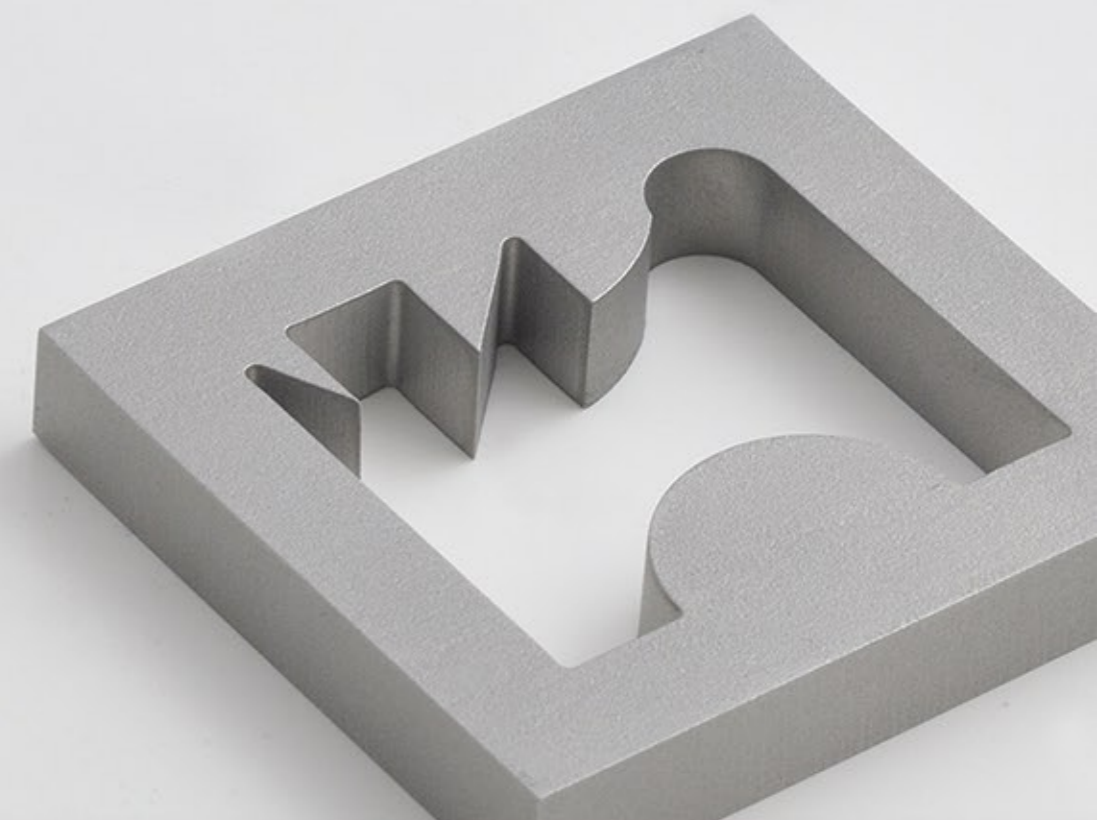
High pressure cylinders seals are the same on the active and passive side as well, which reduces the range of components when replacing seals.

### Unthreaded cylinders - pins

Most pressure intensifiers have threaded cylinders which are expensive and impractical. They often sinter, which requires not only replacing cylinders, but also elements of bodies connected to them. This leads to a multiplication of the operating costs. The Accustream pumps are equipped with unthreaded pins and cylinders. In case of damage, such pins are very cheap and easy to replace. This reduces operating costs considerably.

### Larger diameter cylinders

Cylinders installed in KIMLA machines have a much thicker wall, which increases their lifetime, which, therefore, has a higher resistance to wear.

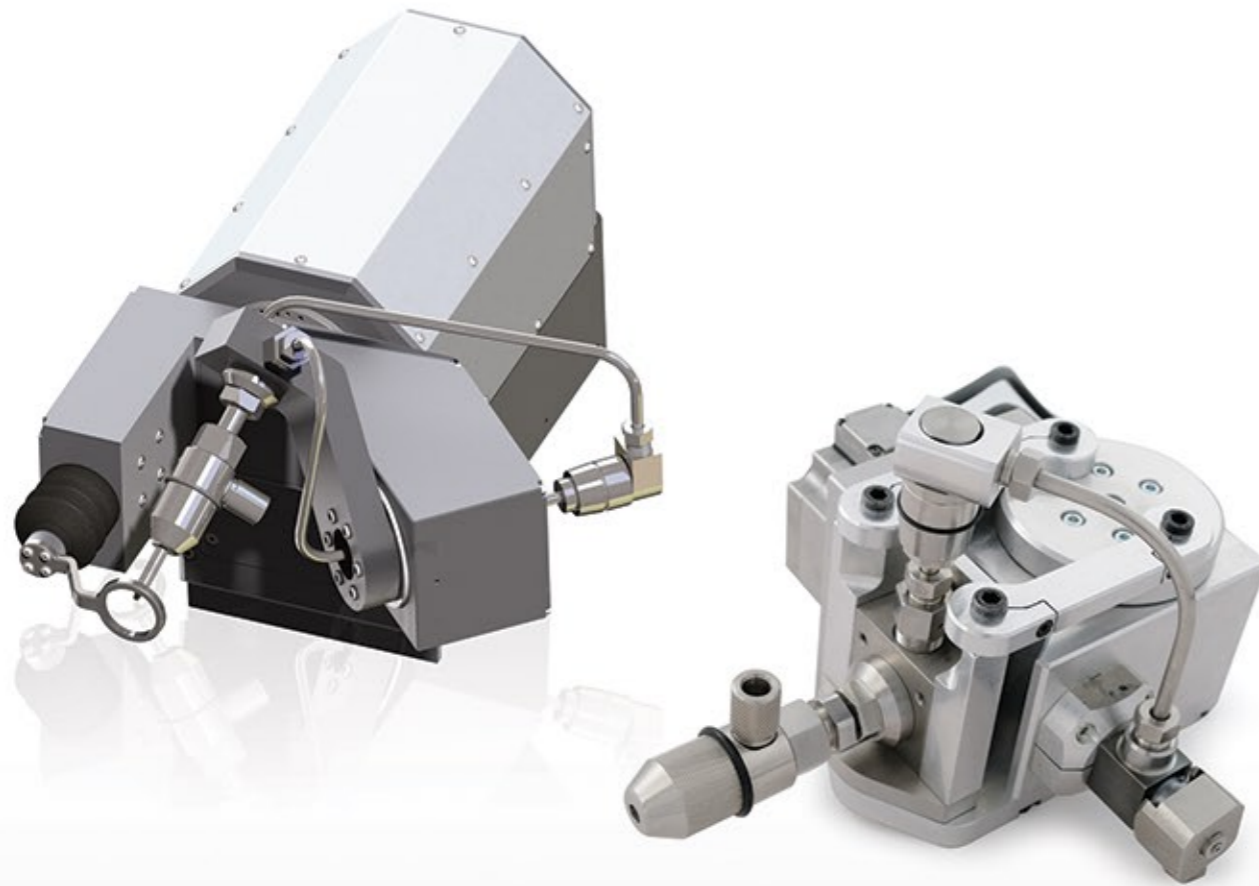


### AccuStream AS 6050 pump parameters

Performance	4,16 l/min
Maximum diameter of the orifice	0,3556 mm (0.014 cal)
Pressure	4150 bar (60 000 psi)
Configuration of the intensifier	single
Pressure control	manual or automatic
<b>Electrical data</b>	
Engine power	50 KM (37 kW)
Voltage	400 V
Current (power) during operation	74 A
Soft start	yes, Y-Delta
<b>Dimensions</b>	
width	1930 mm
depth	1016 mm
height	1422 mm
weight	1406 kg

## High-pressure head

The cutting head is an essential part of the whole waterjet system. KIMLA machines are equipped with high-pressure Accustream heads. All components of the head are designed and manufactured with extremely narrow tolerances to ensure the perfect combination of components with maximum precision and reliability. In KIMLA machines with Accustream 50HP pumps you can apply orifices up to 0.014"(0.36mm) and mixing tubes of 0.040"(1.016 mm). Other manufacturers, using smaller pumps, can apply only tubes up to 0.030" (0.76mm) and orifices up to 0.010"(0,254mm), which directly affects their productivity.



We are pleased to inform you that the POLCOM KIMLA company has been awarded the Gold Medal of the Poznan International Fair ITM POLAND 2011



In the field of  
INNOVATIONS - TECHNOLOGIES - MACHINES  
the Competition Jury awarded the prize for  
the **KIMLA STREAMCUT Machining Centre**





# KIMLA

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