# OPTIONS FOR FINECUT WMC 500II

Version: 20180217















Finepart
Sweden AB

## Finepart Sweden continuously develop the technology in cooperation with our customers

*This leads to introduction of new optional features. As a customer of Finepart Sweden you can always take part of the latest technology as we have the policy that all new options will be retrofit-table to all machines in the Finecut WMC500II series. Options that are ordered with a new machine will be assembled with the machine and does not have any extra installation cost. Retrofitted options will need a visit of our service technician to install and verify the functionality, which will be offered on request.*

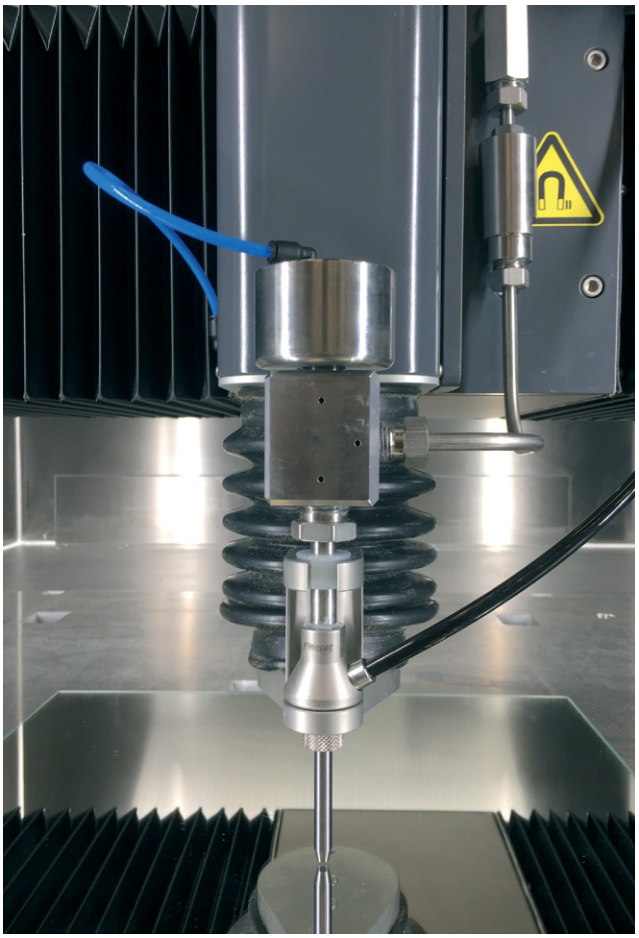


*Greetings from the Finepart team!*

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# CUTTING SYSTEM OPTIONS

**The FinecutWMC500II machine is delivered with one complete cutting system, of choice of the customer. For quick exchange between cutting systems, and additional cutting possibilities, it is useful to choose one additional cutting system from the list below.**



## FAW200-300 Fine Abrasive Waterjet Cutting System

No.: 6 001 000

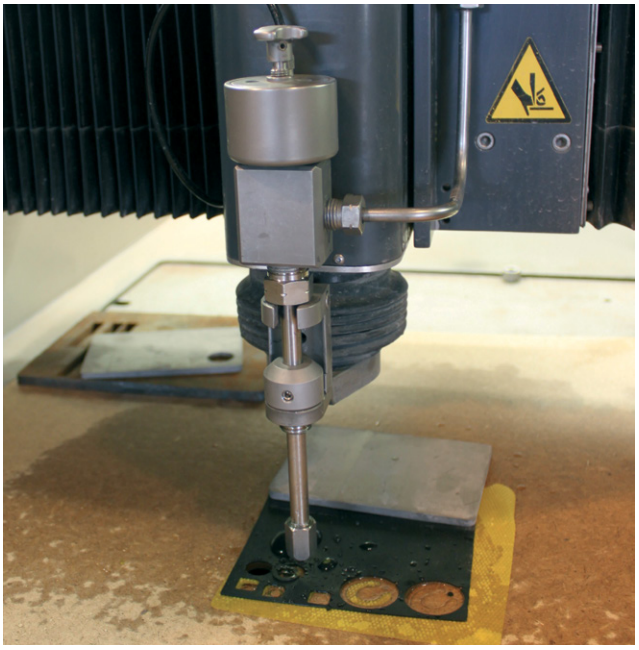
Fine Abrasive Waterjet cutting system with 0.2 and 0.3 mm jet diameters. This is the cutting system for you, who need narrow cutting lines and complex geometries at the highest precision. Cutting heads fitted with orifice up to 0.12 mm. 0.20 – 0.30 mm focusing tubes. To be connected to the Finecut CNC controlled abrasive feeder (belt). This option includes one complete nozzle assembly (Cutting head and ON/OFF valve) and you can choose between FAW200 and FAW300 focusing tubes.

## AWJ Abrasive Waterjet Cutting System

No.: 6 001 100

Abrasive Waterjet cutting system. For thick materials or when the narrow cut is not required traditional abrasive waterjet cutting can be applied using jets of 0.4 or 0.5 mm. These systems offer higher cutting power and are recommended if you focus on higher cutting efficiency and are in less need of narrow kerfs. Cutting head for up to 0.20 mm orifices / 0.4 – 0.5 mm focusing tubes. To be connected to the Finecut CNC controlled abrasive feeder (belt). This option includes one complete nozzle assembly (Cutting head and ON/OFF valve) and you can choose between AWJ400 and AWJ500.



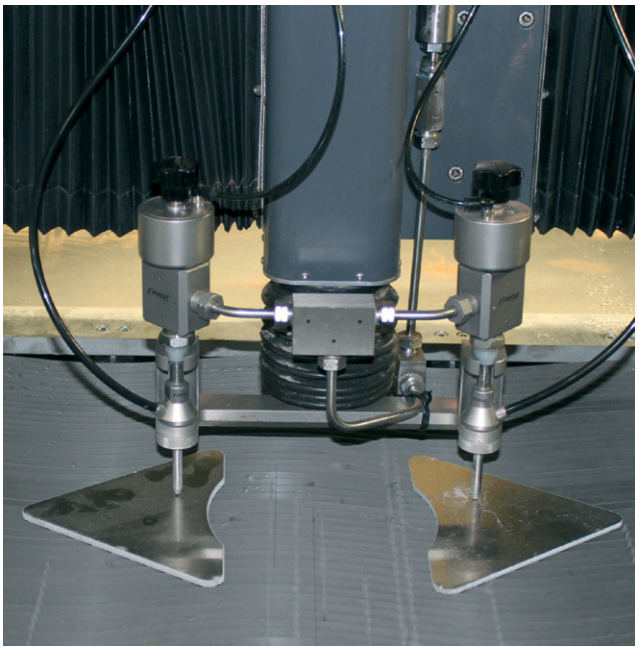


## Pure Waterjet (PWJ) Cutting System

No.: 6 001 200
Pure waterjet cutting system that use water only for cutting soft materials such as plastics, rubber, food products, etc.

The pure waterjet cutting system does not utilize the abrasive cutting head, whereas only the water jet produced by the orifice is the acting cutting tool.

The kit includes nozzle tube and holder assembly for addition to existing FAW/AWJ system, where it replaces the abrasive.



## Dual cutting heads

No.: 6 001 300
The Finecut WMC500II can be equipped with dual cutting heads. This enables two systems in parallel to perform cutting of the same geometry. This option offers the opportunity to double the part production rate. The system can be run with one or two jets depending on your current needs by a simple selection in your Finesoft software.

Fitting double cutting head assemblies requires also the fitting of double abrasive feeders. Cutting parts with dual head implicates some loss of precision as individual radius tool compensation can not be fully realized for both heads. The dual cutting head option can not be combined with the 5-axis option.

The Dual cutting head kit includes:
- Finesoft dual head software plugin,
- Complementary cutting head assembly including high-pressure connections and customized tool holder.
- Complementary abrasive feeder with holder.

*Note: ON/OFF valve is not included.*
*Note: Restrictions may apply to the combination of some cutting systems and pump systems*

# PUMP SYSTEM OPTIONS

## External Pump System (UHDE HPS 4011 or HPS 4022)

We offer high pressure pumps from Uhde High Pressure Technologies. From our experience these premium pumps meet the highest demands in quality, reliability and process output. To obtain a high quality cut the stable hydraulic power delivery from the pumps is of utmost importance. The pump's hydraulic system requires cooling. Depending on the customer's preferences the pumps can be delivered with air-oil cooling (fan) or water-oil cooling.

All pumps are controlled from the Finecut machine control system. Pump start/stop and pressure levels are set in the Finecut HMI.

A selection of high-pressure pumps is available. Pump size selection depends on what high-pressure water flow rate that is required. The maximum high-pressure water flow rate will determine the maximum size of the water jet that can be used in the system. A larger pump can also be used to serve more than one Finecut machine.




### UHDE HPS 4011

For PWJ, FAW and AWJ applications: all orifice sizes up to 0.20 mm.

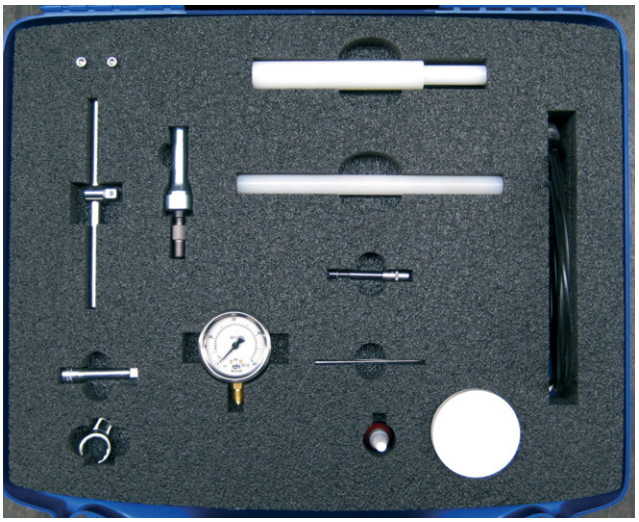
Std. system includes pump pressure control from machine HMI. Max 1.2 liters per minute.

### UHDE HPS 4022

For PWJ, FAW and AWJ applications: all orifice sizes up to 0.25 mm Standard system includes pump pressure control from machine HMI. Max 2.3 liters per minute.

# Pump self-service option

With training from Uhde, customers that have their own maintenance team can, after the warranty period, service the high-pressure pump themselves. To facilitate this service, we offer the required tools and spare parts kit.

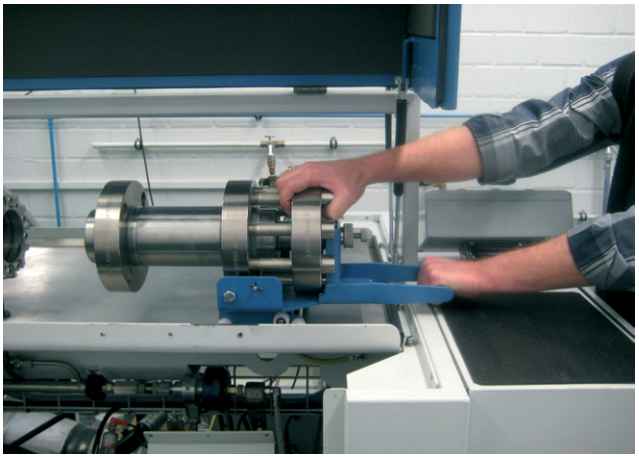


## High-pressure pump tools

**No.: 6 001 400**

Special tool kit from Uhde High Pressure Technologies that includes the special tools that are required to perform seal changes in the intensifier's oil and water hydraulic cylinders.

In combination with a special pump training course this tool kit enables you to make periodic maintenance on the intensifier pump topwork.



## High-pressure pump – mounting trolley

**No.: 6 001 500**

The mounting trolley is a support wagon that ensures alignment between the high-pressure plunger and the cylinder. This tool is needed to not accidently break the plunger.

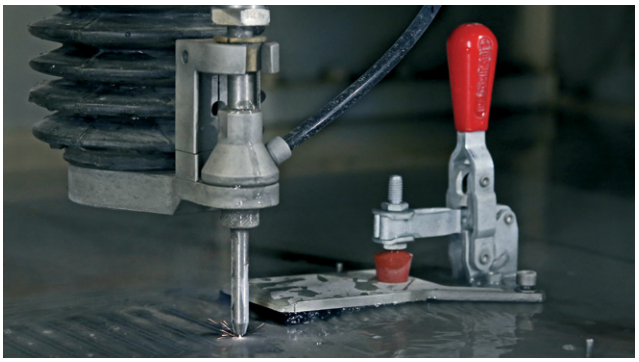
## High-pressure pump – spare part kit

**No.: 6 001 600**

The spare part kit is a range of selected spare parts that is good to keep in storage to ensure you can repair a seal failure and quickly get the pump into order.

# WORK HOLDING SOLUTIONS

**Work holding for micro abrasive waterjets are different from traditional waterjets, and a very important part of successful job. The rigid machine table of the Finecut WMC 500 II is made for precise work fixturing.**

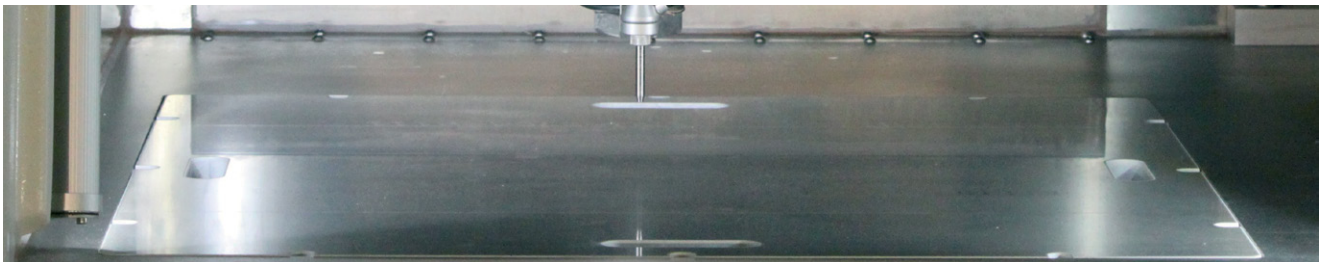


With precise guides in the machine, work holding can be accurately build for each application. It can be easily stored and fitted again for following orders. You can build your own fixtures or use commercial fixturing systems for the W-EDM as you wish.

## Work holder – plate

No.: 6 001 700

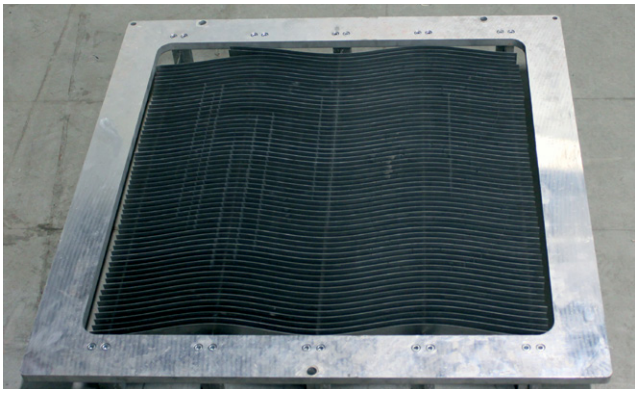
A flat aluminium pallet adopted for the guides in the machine table. With this plate a wide variety of customized fixturing solution can be made. Guiding pins in the machine table ensure accurate re-fitting of the fixture plate for returning jobs.



## Work holder – plate with precision guides

No.: 6 001 800

Aluminum pallet, made out of aluminum plate ground for flatness. This plate has reinforced guiding holes machined in stainless steel. Same function as the above but one notch better precision for repeatability when re-fitting fixtures.



## Work holder – wave grid

No.: 6 001 900

Wave grid holder is a multi-purpose work table solution.

Use this to place and material and quickly cut a part from it. The wave grid uses exchangeable wave formed deep and thin slats that support the work piece.

With wave formed slats the risk of cutting along a slat is minimized. As the slats wear they are exchanged for new ones.

# CLEANING AND VENTILATION




## Wash gun

No.: 6 002 000
A wash gun installed on to the machine will facilitate cleaning of the machine table, fixtures and cut parts.

The wash gun is normally connected to the fresh water supply. In case it is combined with the rust inhibitor option it uses water from the catcher tank in order to maintain the concentration of the rust preventing additive.




## Mist extraction

No.: 6 002 100
During piercing and cutting some water mist is produced which, if it becomes excessive, may introduce moisture into the abrasive feed system.

Mist extraction enhance the possibility for visual inspection of the cutting process.

The Finecut WMC500II has a connection for ventilating the work envelop. With a mist extraction option there will be no need to connect the machine to an existing building ventilation system as it is self-sufficient. The mist extraction system will separate water from the air and discharge it to the drain.

The mist extraction unit is placed behind the machine and connects to the diam. 100 mm ventilation port on the machine's back side.

# ABRASIVE HANDLING SOLUTIONS

**The abrasive system uses a bulk feeder to continuously supply the CNC-controlled precision feeder with abrasive. For the fine precision powder abrasive, the abrasive delivery system has a built-in air treatment that promotes the abrasive precision feeding. For coarser abrasive media (typical for AWJ cutting systems) bulk feed does not need the air treatment.**

The following complementing bulk feed hoppers for the abrasive feeding system can be fitted in the machine:

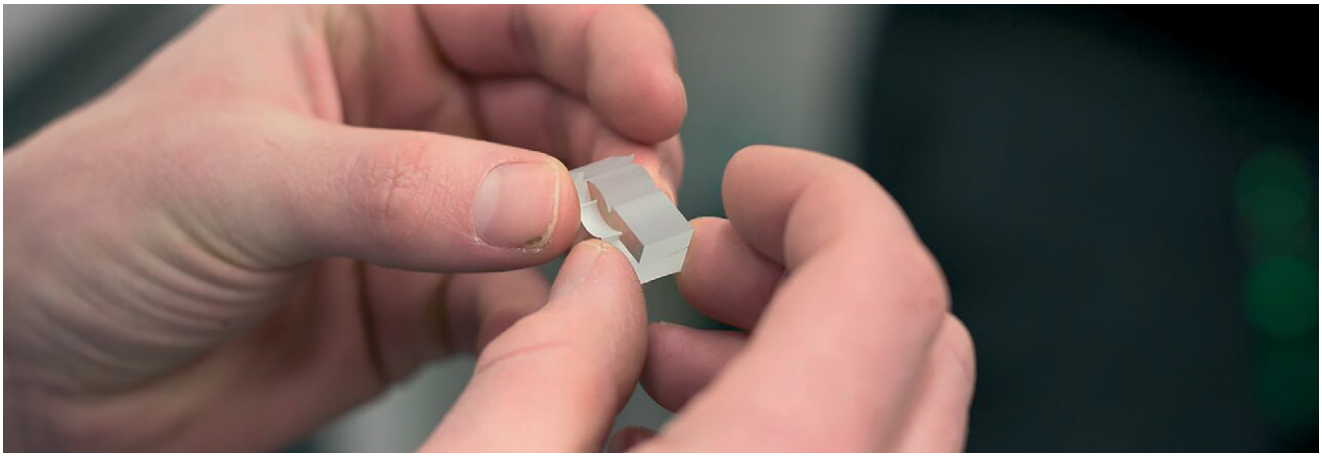


## Complementing FAW pressure vessel for alternative abrasive

No.: 6 002 200

The micro abrasive waterjet uses fine precision powders as abrasive media. Abrasive powders are loaded into a pressure vessel and are transported by air pressure to the precision feeder unit inside the machine. Smaller particles become more susceptible to attract moisture from the air. To ensure a good flowability for these powders the pressure vessel for precision powders are pressurized with air from an air drier.

The standard machine is delivered with one precision pressure vessel. A double set-up means that the machine has two precision pressure vessels. In case you want to run two different grades of abrasive you can quickly adopt your cutting tools and switch between these two vessels. Alternatively, it may be used to double the amount of abrasive media available in one batch and doubles the cutting time between filling up. It enables filling one vessel while using the other to maintain continuous cutting.



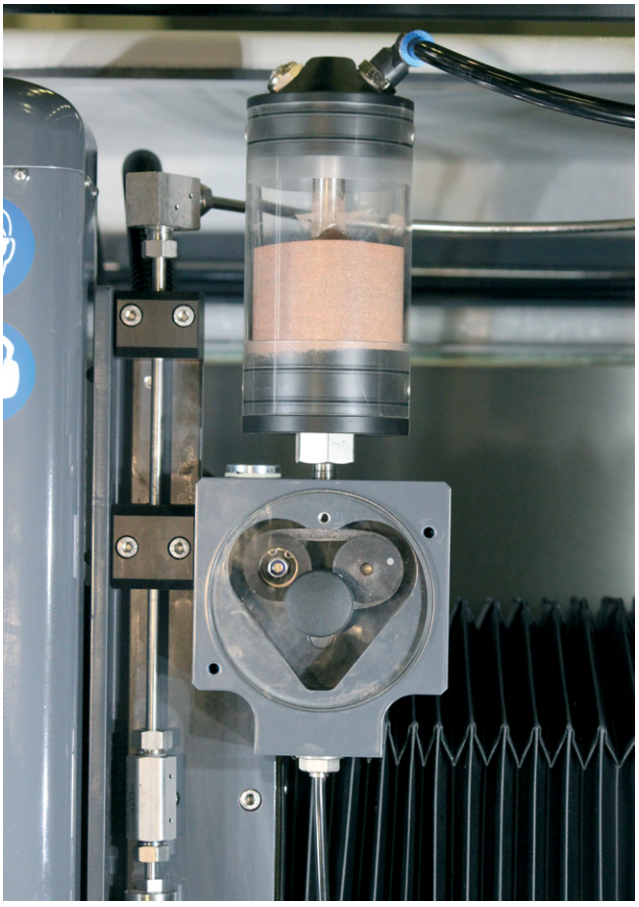



## External bulk feeder for AWJ systems (100 kg):

**No.: 6 002 300**
For use with coarser abrasive media (e.g. #120 mesh) used with AWJ cutting systems.

As traditional AWJ requires higher flows of abrasive. It can be combined with fine abrasive vessel above for complementary use.

Note: This solution is not recommended for the finer sieves of abrasives as is has no air drier capacity.



## Complete abrasive feeder

**No.: 6 002 400**
When you are using different abrasive media in your cutting process it is useful to install an additional abrasive feeder. With this option you will be able to change between abrasives quickly and you do not need to empty and clean the abrasive feeder system at the changeover. The abrasive feeder system is a Allfi system, modified according to Finepart's specification.

## Spare part: Renovating kit for abrasive feeder

**No.: 6 002 500**
(belt + motor + wheel)



# ABRASIVE REMOVAL SYSTEM

**When using AWJ cutting systems (AWJ400 and AWJ500 systems) greater abrasive flow rates are used and the catcher tank will need more frequent abrasive removal. For these applications an automated abrasive removal system can be applied. These systems circulate the water from the catcher tank to an external filtration system.**

There are two types of abrasive removal systems available:



## A. MBM-ASAS

No.: 6 002 600

This system uses a big-bag filter system. It has a high flow circulation and is therefore more suitable for inter-mittent usage: a tank cleaning cycle that is performed periodically. The big-bag has a capacity of ca 500 kg spent abrasive.

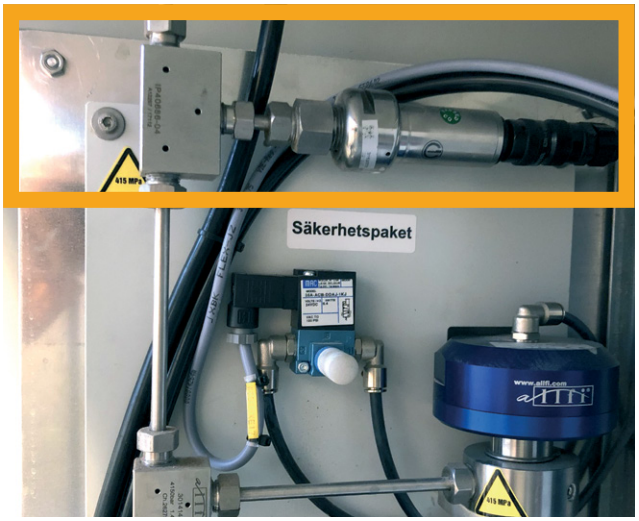


## B. Knoll filter system

No.: 6 002 700

This system operates continuously and circulates the water over a fleece filter. This filter system is emptied continuously as the waste bin fills up.

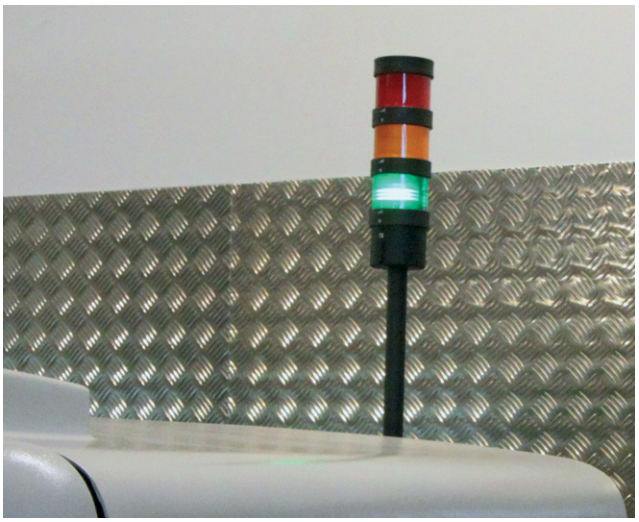
# PROCESS MONITORING SOLUTIONS




## Pressure sensor for high pressure water system

No.: 6 002 800

A high-pressure sensor placed in the high-pressure line, just before entering the machine work space, ensures that you know your actual pressure levels at the nozzle rather than at the pump. The sensor reading is integrated in the control system and is presented in the Finesoft HMI. Especially when you have a long distance between pump and machine, or if you have several machines at different distances from the pump, this option allows you to optimize your cutting parameters for most efficient and economic operation.



## Exterior signal tower

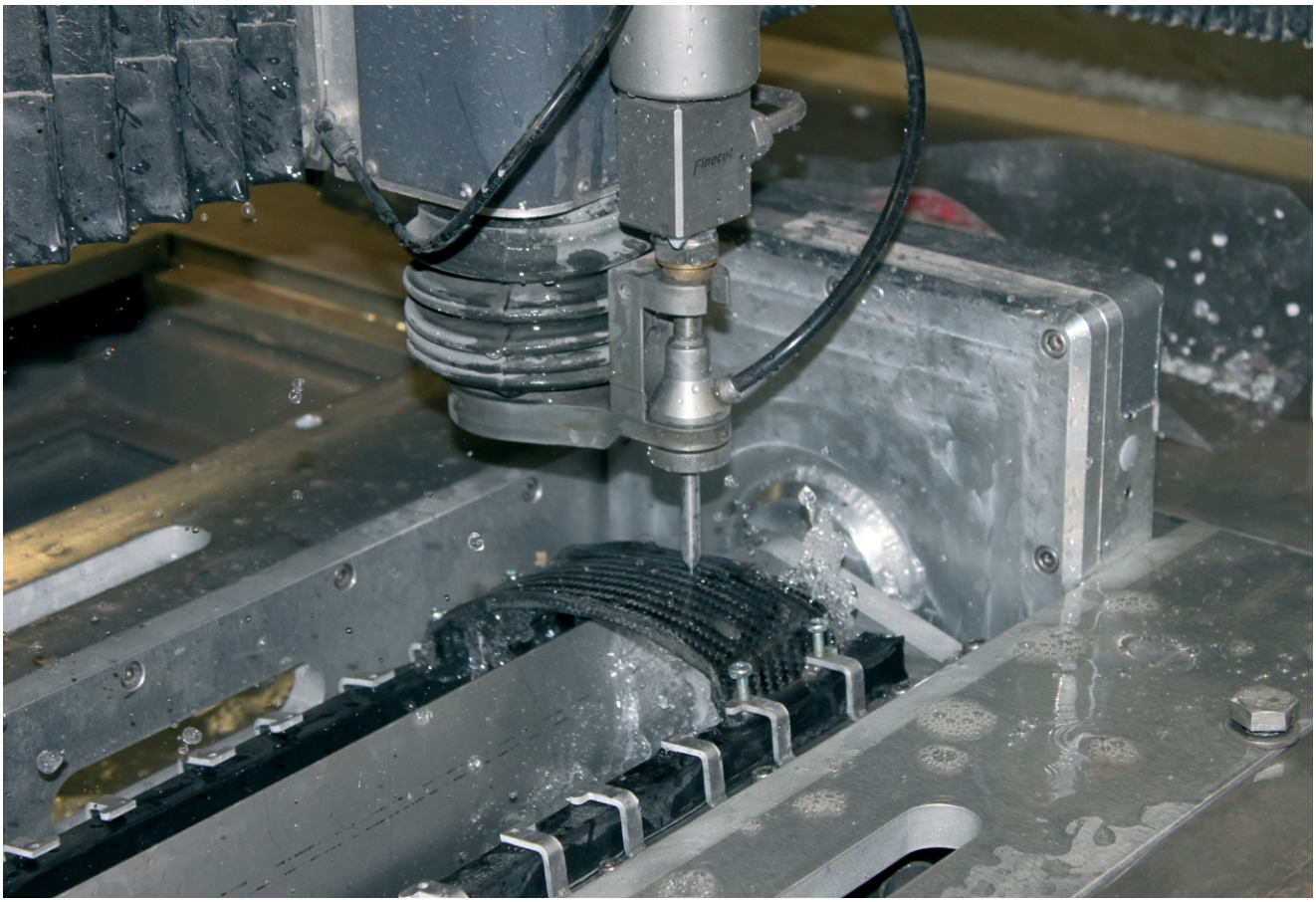
No.: 6 002 900

The machine has indication of messages and alarms on the HMI. This duplicates the signals on the operator panel but is visible across the work shop. Suitable if you have few operators to cover a big work area. Light tower feature green, yellow and red light signals from the controller. Mounts on machine top cover.



# ADVANCED MANIPULATION OPTIONS

**For customer solutions we have developed a range of advanced control options that support accessibility in cutting 3D structures, cut 3D parts from flat stock or just to make taper angle compensation.**

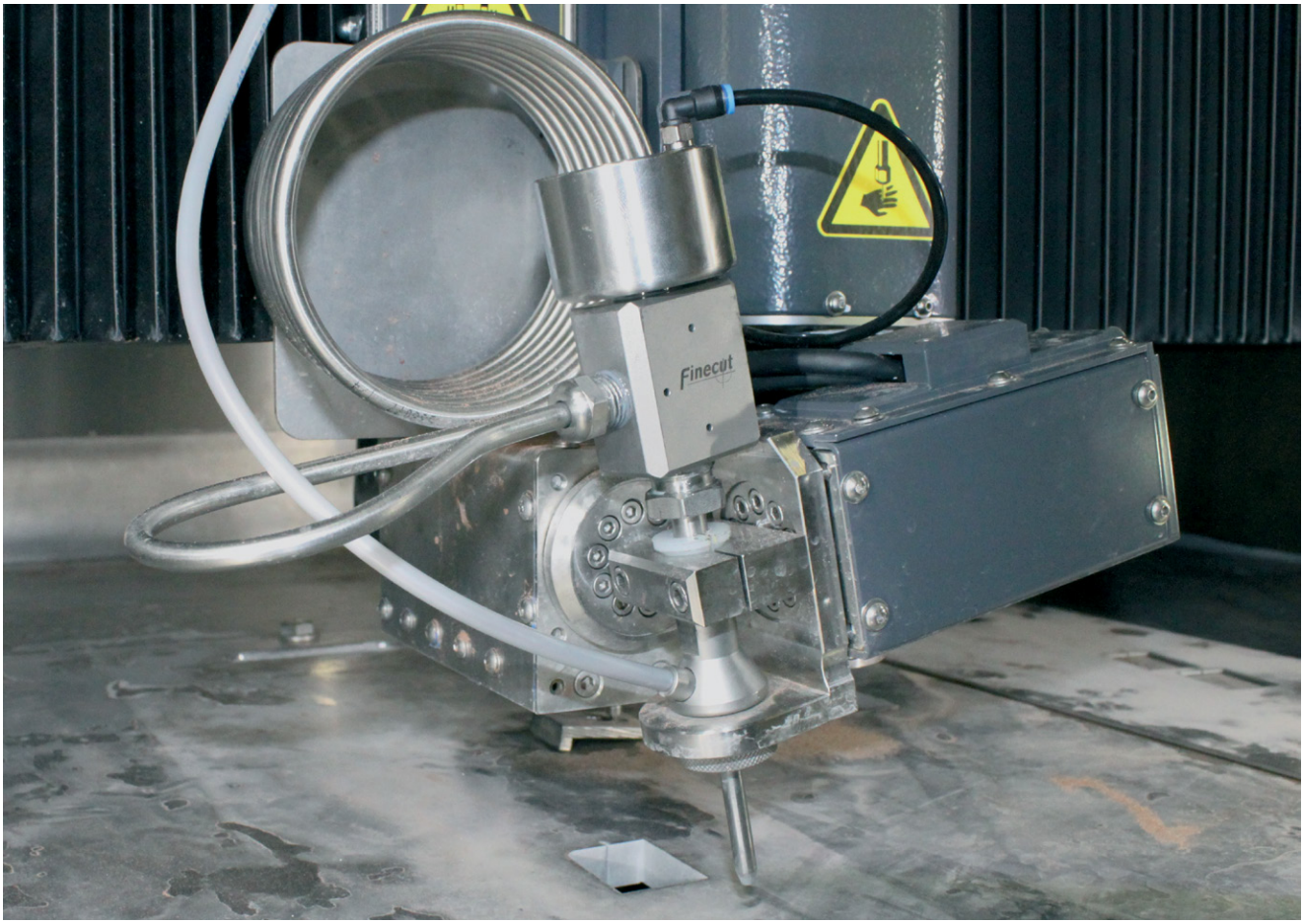


## Rotary/spindle axis (4th axis)

**No.: 6 003 000**

The rotary axis can be used for various cutting operations including:

- cuts that require a rotary motion around an axis synchronized to the X-Y-Z motion to create a desired geometry e.g. such as tube cutting, treads, etc.
- cutting parts of rotational symmetry, similar to the use of a spindle function but using cut-out rather than perimeter erosion.
- act as a live motion fixtures where a complex geometry is oriented towards the jet in a synchronized motion as to create prerequisites for a continuous cutting access while following a line along a 3D surface of the work.




## 5-Axis manipulator

**No.: 6 003 100**

This option utilizes a range of options that enable the 31i-B5 control system of synchronous A and B axis for 5-axis control. You can upgrade your motion control with synchronous A and B axis movement which gives a full 5-axis control with tool center point (TCP) functionality.

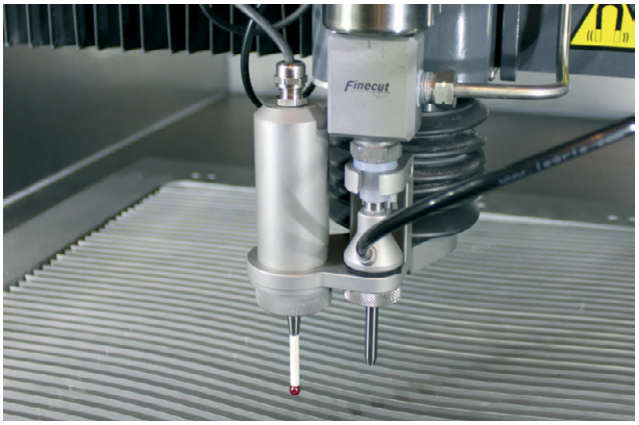
The 5-axis motion system can be used for slanting the cut surface to create 3D geometries, relief angles or just to compensate for cut taper angle. The standard 5-axis option facilitates 3D cutting up to +/- 15 degrees.

The micro abrasive waterjet produces fine surface finish inherent to the fine powder abrasives even when cutting too fast to erode the full width at the bottom of the cut. Instead of reducing cutting speed to allow for more erosion at the bottom an angular adjustment enables programming up to 40% increased cutting speed, while attaining adequate cutting speed. This is an option can that pay off quickly!



# PART INSPECTION AND MEASUREMENT OPTIONS

**When a cutting operation is performed as one in a sequence of machining operations, the cut path will need to be positioned within a part geometry. One way to assess the part position may be to measure its location. The Finecut option program includes two different measurement approaches, a tactile probe and a non-contacting video camera measurement.**

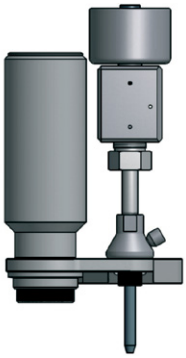



## Finepart touch probe including software module

No.: 6 003 200

The measuring probe utilizes the Renishaw LP2DD probe and is useful when you need to position more complex parts for additional machining, and besides finding edges also require the ability of 3D measurements. For example, the probe can be used to:

- locate a hole or boss
- find an angle on a workpiece, and angle towards machine axis
- locate an edge.



## Video measurement system

No.: 6 003 300

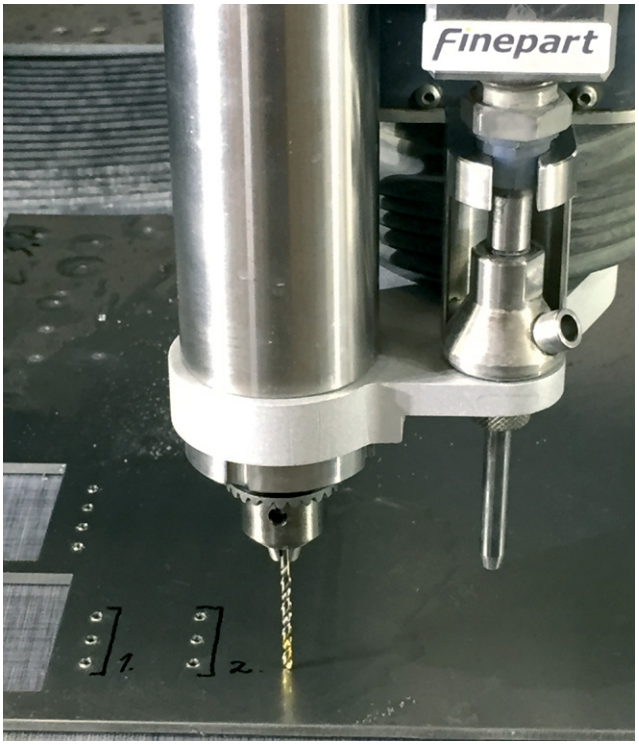
The video measurement system is a straight-forward and simple-to-use measurement tool as you will see the part on the screen and do the measurements by moving the camera cross-hair over the features you measure. However, this system can be used only for two-dimensional measurements.



# HYBRID MACHINING

**For some machining operations a tool combination will increase the machine productivity and/or quality of the parts. For example, some materials are difficult to pierce through with the high-pressure waterjet, even if reduced starting pressure is applied. Such materials can be layered materials and composite material that may delaminate. A mechanical drilling tool is a proved solution to avoid this effect.**

## Drilling




### Pneumatic drill unit incl. special tool holder assembly, sensor and installation kit

No.: 6 003 400

The drilling unit is a pneumatic unit mounted at an offset to the side of the cutting head. When activated it moves to a position below the jet nozzle starts the drill and plunges at a controlled feed motion into the material to grant a precision drilling of your workpiece. For work-pieces that are mechanically drilled the micro abrasive waterjet will not require risky piercing actions.

## High frequency spindles – for drilling, milling, grinding and engraving

### High Frequency Spindle unit for drilling and milling incl. special tool holder assembly (Small)

No.: 6 000 100

The high frequency unit is a 200W electrical unit mounted at an offset to the side of the cutting head. Spindle speed 5 000 - 60 000 rpm. For up to 4 mm end mill. The unit can for example be used for carbon fiber reinforced plastic or aluminum.



### High Frequency Spindle unit for drilling and milling incl. special tool holder assembly (Large)

No.: 6 000 200

The high frequency unit is a 450W electrical unit mounted at an offset to the side of the cutting head. Spindle speed 5 000 - 40 000 rpm. For up to diam. 6 mm end mill. The unit can for example be used for carbon fiber reinforced plastic or aluminum.

# WATER TREATMENT OPTIONS




## Water treatment system for stabilizing minerals -EKOWA

**No.: 6 003 500**

The water quality is very crucial for the micro abrasive waterjet process. The limits for water quality is stated in our quotation and most of our customers need some water treatment system. We usually recommend a system from Ekowa that stabilize the water and prevent minerals from solidifying under pressure.

***Water quality medium: WIN-L-2054WSi***

- Quantity: 200 to 400 mg/l
- Non-hazardous
- Mode of action
  - *stabilization of silicates*
  - *stabilization of hardness and ph-value*
- Results
  - *No outfall of silicate crystals*
  - *No limescale (Mg, Ca, Na, Cl-mud)*
  - *Optimized corrosion protection*




## Rust inhibitor

**No.: 6 003 600**

For application specifically sensitive to corrosion due to long period contact to water, for example advanced fixturing devices, a rust inhibitor can be added to the water. This system includes an accurate dosing unit and add the rust inhibitor at every instance the water jet is running.



# SOFTWARE OPTIONS (CAD/CAM)

**In the analysis of each customer needs, we will make a tailored proposal for the customer what CAD/CAM software options that are recommended for their operation for an efficient and easy operation.**

The Finecut machine has a powerful computer onboard and the CAD/CAM software can be applied on the machine as well as in the office.

We work with IGEMS software, which is software especially developed for waterjet cutting. The software is installed in a normal PC and is easy to handle. There are several different software options such as; CAD, CAM, AWJ, DataExchange, Nest Level 1and 2, 5X-CAM etc. The different options will allow you to draw parts, prepare parts for cutting, adjust cutting quality and cutting parameters, calculate time and cost of parts, get proposal for nesting etc.




## Separate Modules

### IGEMS CAD *

Igems offer you a complete 2D CAD with layers, dimensions and many more features for making perfect drawings.

### CAM *

Decide how you want to cut your parts. This module handles the CAM settings for machines with up to 6-axis. Use the pre-defined automatic settings, or customize you leads and cutting quality to suit your own needs. Specially developed to suit the abrasive waterjet process.

### AWJ *

The AWJ module includes machine settings with parameters such as material thickness, material quality, pressure, abrasive flow etc to optimize the cutting speed. The module is essential for cutting with waterjet machines.

### CAM Tools

Geometry optimization for damaged drawings. This module includes different applications for optimizing the contour. It will reduce the number of objects in a contour without destroying the measurements and can be used to remove overlapped geometry and heal geometries with gaps and other defects.

**) Minimum requirement for the system – included in standard system*

## DataExchange

Import more file types. With our DataExchange module you can import several other file formats than the standard .dxf, .dwg, .acd & dig files. With the module, you can import .wmf, .ps, .eps, .gen, .geo, .igs, .mec, .ord & .tag files. You can also import your NC code back into igems with the special command NC reader.

## Nest Level 1

The nest modules help you to arrange the layout of parts on a sheet in order to get as little waste material as possible. Nest 1 includes several semi-automatic nest strategies, including circle nest, rectangle nest & single nest.

## Nest Level 2

A fully automatic nest command. The nest modules help you to arrange the layout of parts on a sheet in order to get as little waste material as possible. This module is a must if you need to nest many different parts at the same time on a predefined area of any shape. Nest 2 cannot be bought without Nest 1.

## SignMaker

Use fonts & images in your drawings. The module allows you to import images onto you drawing and automatically use it to generate CAD vectors, or use as a background for manual generation of vectors. You can also use true type fonts that will be converted to smooth geometry.

## 5X-CAM

For 5-axis control the 5X-CAM is required. 3D-5X module will supply you with NC programming with full 5 axis controls, meaning X, Y and Z linear positions and A, B and C information for the 5-axis kinematics. 3D-5X can use STEP and IGES files containing surfaces and solids. It means that you can cut directly on models from your 3D system. (Inventor, SolidWorks, SolidEdge etc.) Just open the file in IGEMS and add a toolpath. 3D-5X is very easy to use compared to other 3D softwares, even on complex geometry.

## TileMaker

Cutting & nesting for inlays & tiles. A module specially designed for the stone industry. It includes a special nesting utility for tile making and commands for making inlays.

## Organizer

Keep everything in one place. The Organizer module is a simple but effective SQL database to store parts and other documents related to the part. Imported geometry to IGEMS can be registered into Organizer after material, thickness, quantity and other parameters applied to the part. Filtering of specific information can be done by setting up filters for quick and easy access of parts.

## TubeCut

Make custom tubes. The tube can be mounted on a C-axis engine, or in a fixture. It can be defined into whatever shape you want and contain holes, cutoffs and special holes like logotypes. It's opened in a 3D viewer so you easily can see what's going on when you're designing.

## Floating License

Multiple users with fewer licences. Floating license is a network license of IGEMS and can be installed in any LAN network. With this option, you can install as many clients as you want and administrate the access with the Floating license module.

## Option to add to the above:

IGEMS Service Program. Annual fee upgrades your IGEMS with the latest version.



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