

Automation

In case 8 or 16-hours days are no longer sufficient...

More and more often, the "time to market" becomes a critical survival factor for today's parts manufacture's and tool makers. In ever shorter time intervals, new products are developed and produced. By using the unmanned night-shift hours, the machine capacity is increased and cycling times are reduced. The investment costs start to amortize immediately. With a FEHLMANN automation solution, you may make this approach come true. But that's not all. The Milling Center Manager allows for keeping up the flexibility to produce single parts also in automatic operation.



Lowering costs in praxis.

1. Mould making, lot sizes of 1 to 6 pieces

- Up to 90 spindle hours per working week are achievable.
- The system disposes of the production capacity of two to three CNC milling machines with one operator each in single-shift operation.
- The investment costs will amortize faster.
- The highly-qualified specialized engineers do no longer have to work in shift operation. This facilitates the hiring of staff and improves the motivation.

2. Part production, lot sizes of 10 to 500 pieces

- Up to 120 spindle hours per working week are achievable.
- The system disposes of a production capacity of three to four CNC milling machines with one operator each in single-shift operation.
- The investment costs will amortize faster.
- The machine hour rates are reduced.
- The work of a single person is sufficient to fully utilise the system capacity. The machine runs autonomously overnight and at weekends.

Complete system service

The customer just requires a single phone number for machines, robots, MCM Software and accessories:
The phone number of FEHLMANN in Seon/Switzerland.

As manufacturer of the FEHLMANN machines, we dispose of an extensive spare parts storage. Due to our express delivery services, we are able to deliver spare parts to customers practically all over Europe within the shortest time.

At-the-site service

A team with profound technical know-how in all of our products is ready for you. We are able to make available to you a technician with appropriate equipment and the required spare parts at short notice in case the robot system is down.

Hotline-technicians will actively support you in troubleshooting

In many cases, a malfunction may efficiently be tracked down by phone. This will considerably reduce both downtimes and costs.

Teleservice

Due to the FEHLMANN Remote System (FRS), you can divide your control screen with our technicians, no difference where in the world and in each moment. Important information arrives thus on direct way to us. Possible problems can be repaired so fast and efficiently. FRS is an option, please ask for!

The experience in practical operation.

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Guards could have been removed for better illustration. Subject to technical modifications.

Made in Switzerland



Automation

New standard solutions for flexible production.



C

F

M



AUTOMATION

Parts production or tool & mould making. HSC or conventionally. Highest quality, even during operation without staff.

COMPACT

PICOMAX 60 with Robot Compact

Low space requirement, maximum performance when machining precision parts in 3- to 5-axes.



FLEXIBLE

PICOMAX 95 with Robot Multi

Due to the large machining area and the variable pallet size combinations, this system stands out for its flexibility.



MODULAR

Combined system by the example with the PICOMAX 60 and 90

A concept for various requirements.



Overview

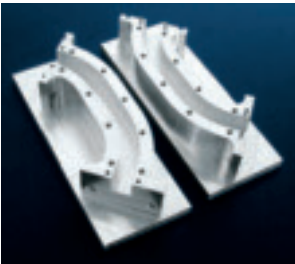
Robot			
Robot type	Robot Compact	Robot Multi	Robot System
Milling Center Manager (MCM)	Yes	Yes	Yes
Operation without MCM	Yes	Yes	No
Gripper change	Yes	Yes	Yes
	Pallet systems can be combined	Pallet systems can be combined	Pallet systems can be combined

Magazine variants			
Pallet type	ITS 50 holder 72 (Ø 72)	ITS 50 holder 72 (Ø 72)	ITS 50 holder 72 (Ø 72)
Max. number of pallets	132	270	approx. 450
Transfer weight	20 kg	20 kg	20 kg
Max. part size (approx.)	Ø 85 x 170	Ø 85 x 200	Ø 85 x 200
working with free stations	Ø 170 x 170	Ø 170 x 200	Ø170 x 200
Machining	3 to 5 axes	3 to 5 axes	3 to 5 axes
Pallet type	ITS 148	ITS 148	ITS 148
Max. number of pallets	60	135	approx. 225
Transfer weight	30 kg	40 kg	40 kg
Max. part size (approx.)	Ø 150 x 170	Ø 150 x 200	Ø 150 x 200
working with free stations	Ø 305 x 170	Ø 305 x 290	Ø 305 x 290
Machining	3 to 5 axes	3 to 5 axes	3 to 5 axes
Pallet type	UPC	UPC	UPC
Max. number of pallets		45	approx. 75
Transfer weight		85 kg	85 kg
Max. part size (approx.)		285/285/300	285/285/300
Machining		3 axes	3 axes

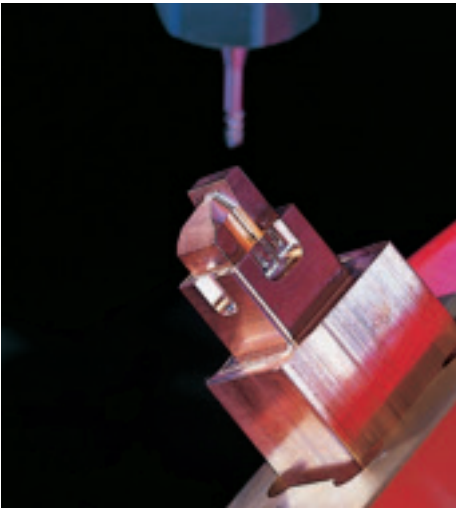
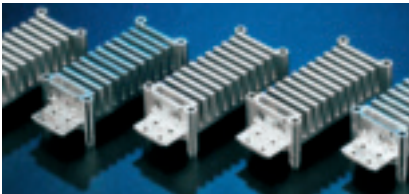
Number of automatically loadable chucks				
Machine / tool places	Loading from	Robot Compact	Robot Multi	Robot System
PICOMAX 60 / 20-24	right	1	1	1
PICOMAX 60 / 28-48	right	1	1	1
PICOMAX 60 / 28-48	left	2	2	2
PICOMAX 90	right	1	1	1
PICOMAX 90	left	2	2	2
PICOMAX 95	right	1	1	1
PICOMAX 95	left	2	2	2

Subject to technical modifications.

3 to 5 axes machining of small cubic part
Conventional cutting, HSC cutting of complex components.
Parts production of single parts up to series production.

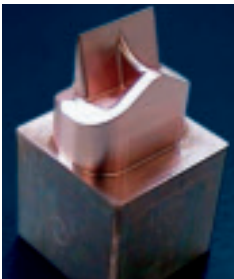


3 to 5 axes machining in tool & mould making
HSC applications as hard milling of mould inserts, electrodes in copper and graphite as well as engraving operations.



PICOMAX 60 -M/-HSC precise, fast, reliable, ergonomic

Precise, as the machine is standard equipped with a couple of high-accuracy „features“ next to a thermally stable design and construction.
Fast, as completely digital axis drives, HSC spindles (optionally high torque or high-power spindle) and a rigid design and construction guarantee maximum productivity.
Reliable, as the machines are in-house produced, assembled, commissioned and tested by FEHLMANN.
Ergonomic, not only as the operating personnel is close to the part, but also due to the well thought out arrangement of operating elements and periphery.



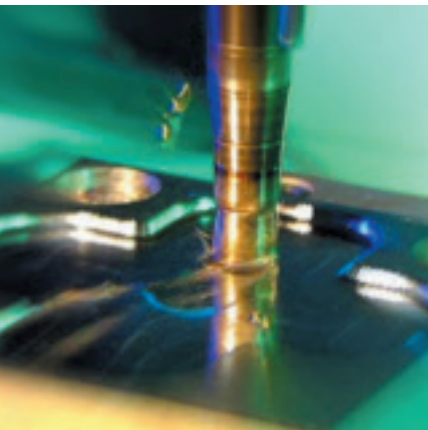
Everything from a single source:
Consulting, production, delivery, training, commissioning and service.

Each FEHLMANN solution offers its own special advantages

The systems are commissioned, configured to the customer and tested in the production work in Seon.
Professional services count among our strong points. Starting from customer consulting before making a purchase decision up to training, commissioning and service.
The FEHLMANN MCM Software – matured and continuously further developed over the years – efficiently controls and monitors your system. In particular in small and medium series production as well as in tool & mould making, the software stands out for its workshop aptitude. This will cut down on your unproductive times.
Machine and MCM software are in-house developed and produced by FEHLMANN. Development, production, assembly, test, training and service – the entire chain lies in our hands.



Through the use of proven standard robots, a maximum degree of operational safety is guaranteed. Next to this, you may freely select your individual configuration (pallet type and number, gripper type). Even at a later point of time, the robot configuration may be matched to the new requirements and demands.
Operator friendliness is of high priority to us. Just take the perfectly ergonomical structure and workshop protection of the operating panel for the Milling Center Manager as an example. The machines are accessible more easily from the front and remain so despite automatic loading/unloading. Even in case of around-the-clock production, maximum part precision is granted. If you are not sure about where you will need automatic loading/unloading before placing the first order, a FEHLMANN automation may be retrofitted at any time.



Hands-on training

Our training and commissioning personnel has undergone a versatile training. Technicians and engineers perfectly know their way around in programming and operation of the PICOMAX machines including robots, software and accessory. What is more – they dispose of technological know-how in the fields of cutting. The praxis-orientated introduction of the knew technologies is one of our strong points.

HSC-Technologie

We are able to offer an extensive professional consultation. Using the “HSC technology” training module, we pass on our profound technical know-how in these areas to our customers.



EROWA Robot Compact - reliable, compact, simple handling

Robot and machine form a compact and space-saving unit. The operation of the complete system from the front leaves no wishes open come to ergonomics.

For the controlling of the systems two options are available: the integrated pallet file or the user friendly Milling Center Manager MCM.

Following
magazine variants
are available:



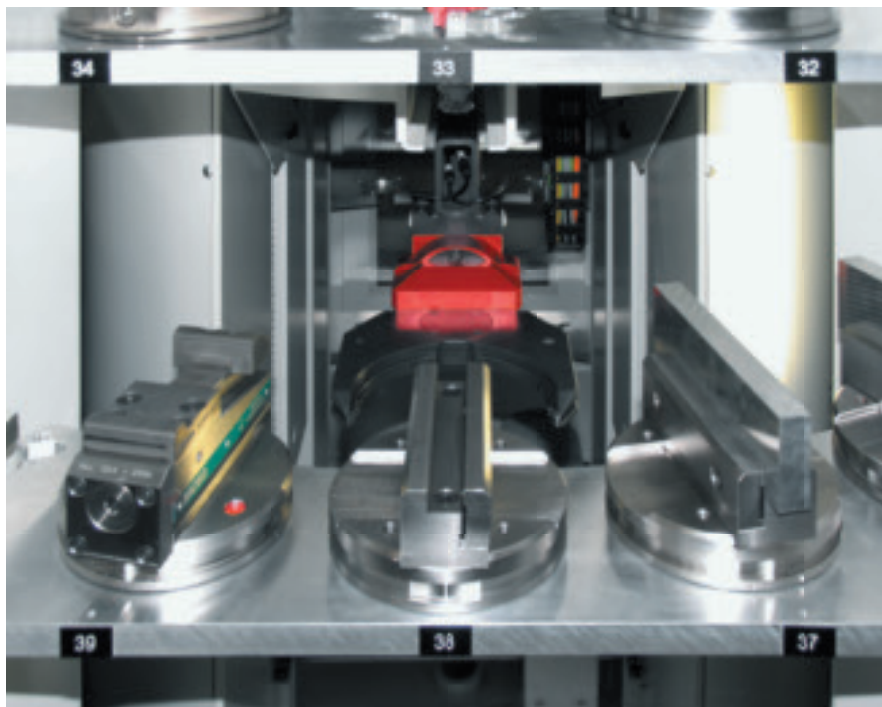
Gripper ITS 148
($\varnothing$ 148 mm)



Gripper ITS 50
(50 x 50 mm)



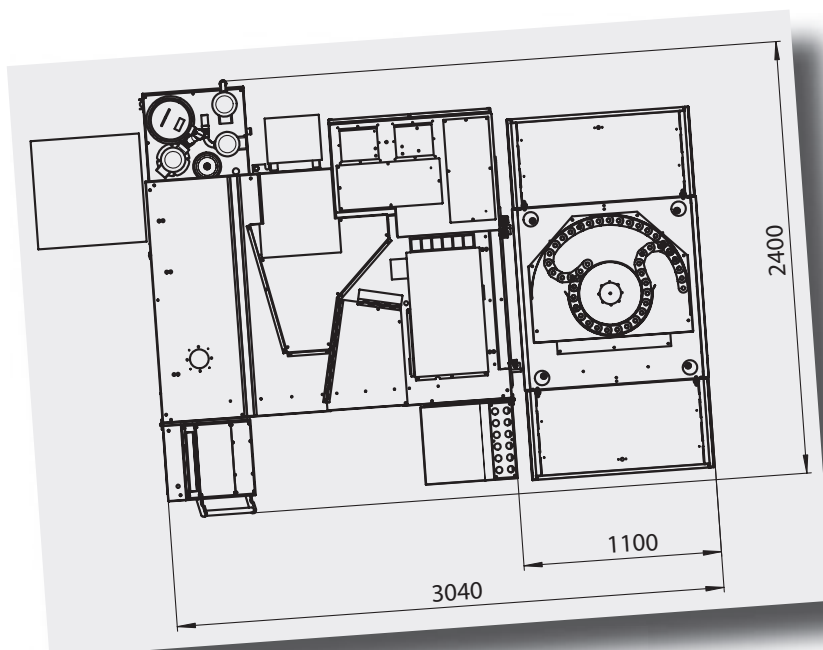
Gripper holder 72
($\varnothing$ 72 mm)



The generous and clearly arranged magazine can be handled from the front and the back.



Easy access to part and operating elements.

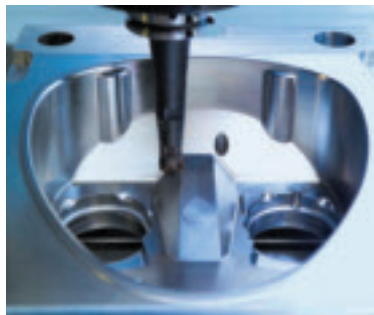


PICOMAX® 95 with Robot Multi



5-axes milling without setting aside the stability and precision of a 3-axes machine. Whether in parts production or in mould making.

Bulky workpieces or multiple clamping fixtures on capacious, rectangular pallets placeable on the generous working table. 5-axes parts on compact, round pallets, machineable on the 4th/5th axis at any time problem-free with optimal access. Ideally suited for: conventional cutting and HSC cutting of complex components as well as hard milling of mould inserts for a single part up to a batch size production.



PICOMAX 95 precise, fast, reliable, ergonomic, flexible

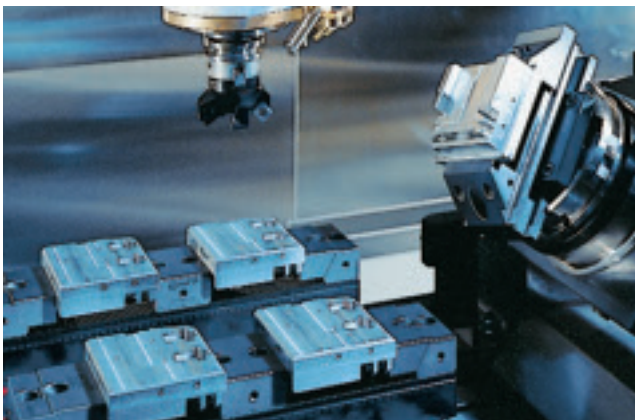
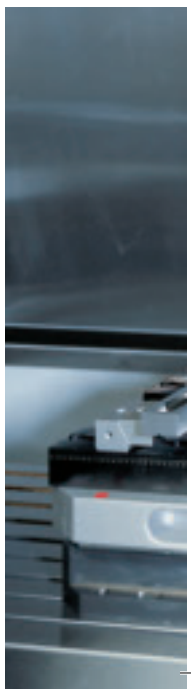
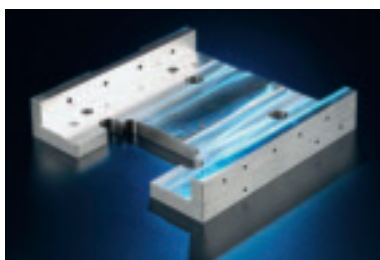
Precise, as the machine is standard equipped with a couple of high-accuracy „features“ next to a thermally stable design and construction.

Fast, as completely digital axis drives and a rigid design and construction guarantee maximum productivity.

Reliable, as the machines are in-house produced, assembled, commissioned and tested by FEHLMANN.

Ergonomic, not only as the operating personnel is close to the part, but also due to the well thought out arrangement of operating elements and periphery.

Flexible, as the machining process can be carried out using the optimum pallet size in each case.





Gripper UPC
(320x320mm)



Gripper ITS 148
(Ø148mm)



Gripper ITS 50
(50x50mm)



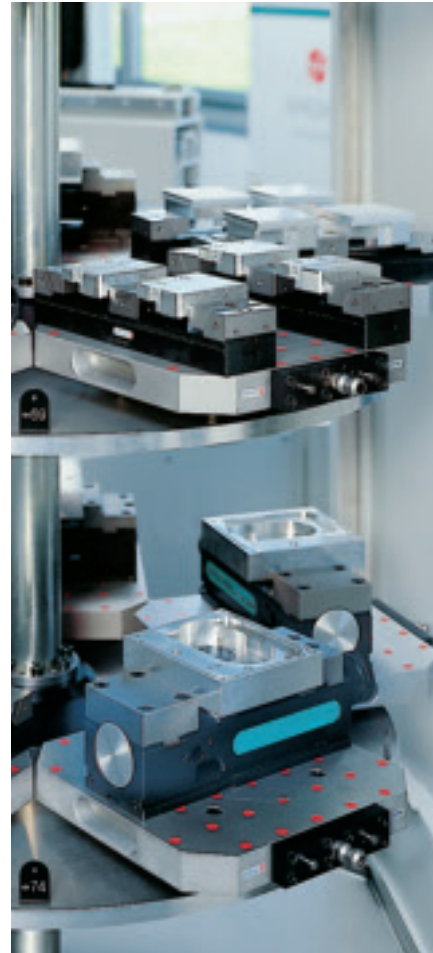
Gripper holder 72
(Ø 72 mm)

EROWA Robot Multi - reliable, versatile, simple handling

The combination PICOMAX 95 / Robot Multi offers a maximum degree of flexibility. The different pallet types may be matched to the application and used without extra set-up work. The FEHLMANN Milling Center Manager guarantees a general survey and simple handling.



Workpiece magazine Rotary UPC
Application mould making



Workpiece magazine Rotary UPC
Application part production



Workpiece magazine Rotary
ITS 148

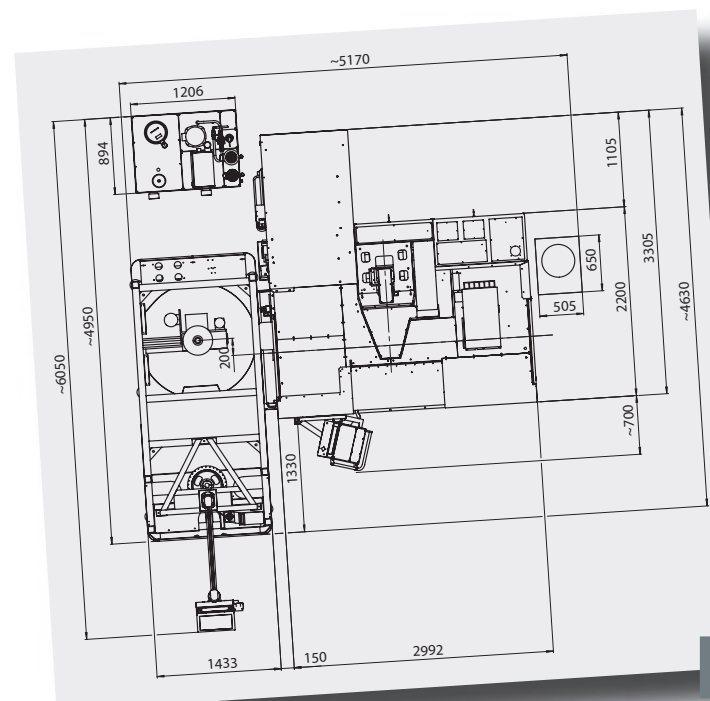


Workpiece magazine Rotary
ITS 50

The Robot can be equipped on demand with an UPC-Rack.

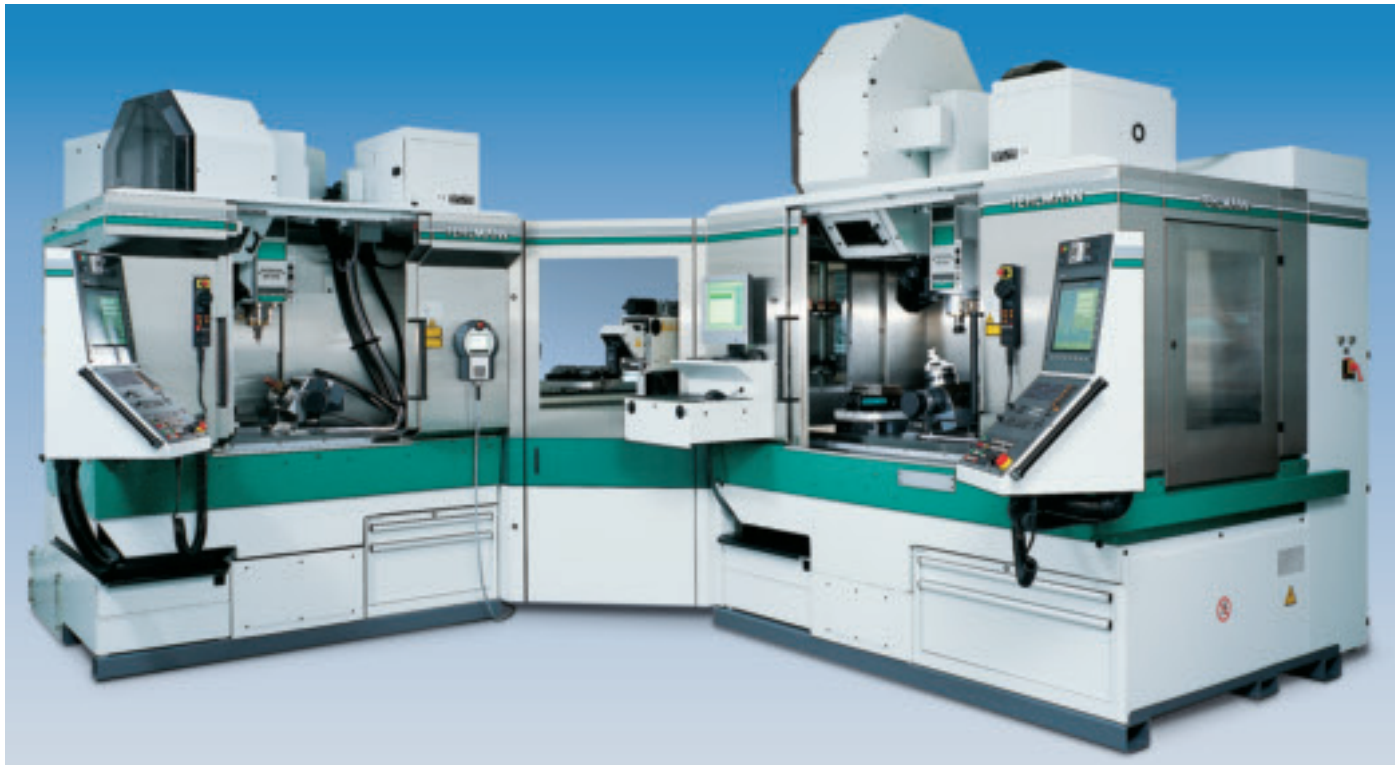


3-axes machining on capacious UPC-pallets
5-axes machining on round ITS-pallets



Combined automation systems

PICOMAX® 60 - Robot System - PICOMAX® 90



The system is controlled and monitored by a central Milling Center Manager MCM. The individual pallet stations must not necessarily be assigned to one machine. The operator defines which pallet is to be machined on which machine. Pallets can be loaded for preparation – for example roughing – first into the one machine and afterwards for finishing into the other machine. Flexibility is increased. The machines remain perfectly accessible for set-up and cleaning works.

Modular configuration

Machine, machine accessories, pallet types, rack and rotary magazines may individually be combined according to the requirements.

Modular purchasing

The initial order may for instance comprise a machine with a given number of pallet stations. As soon as the capacity is no longer sufficient the system may be upgraded.

The later addition...

- ... of pallet stations to increase the autonomy,
- ... of other pallet types to increase the machining flexibility,
- ... of another machine to increase the productivity,
- ... of a loading station to increase the operating comfort,

are just a few examples for the modularity of the system.

Of course, the system may be equipped with two machines and a sufficiently dimensioned number of pallet stations and types right from the beginning.

Modular profitability

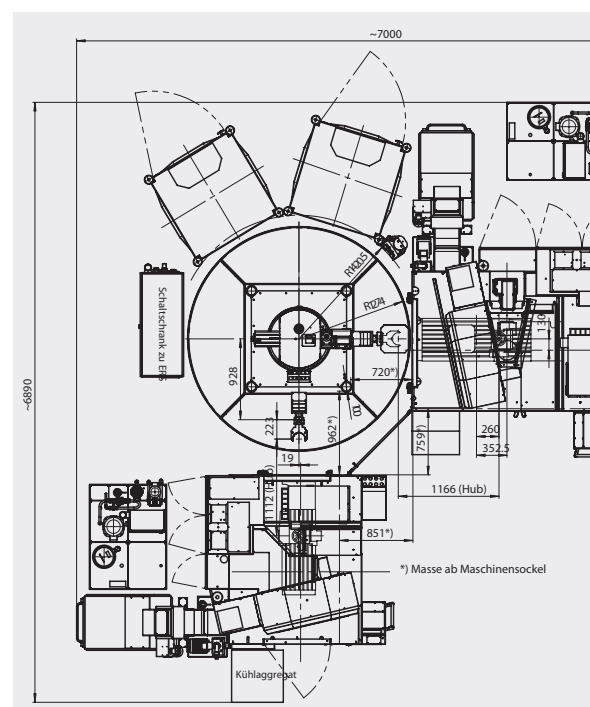
The loading and unloading time of a work pallet averages to approx. one minute.

The machining time of a part – depending on the part – averages between ten minutes and one hour.

In case of a single-machine solution, the robot capacity is only utilised by 10 to 20 %.

It is thus only logical to use the robot for loading/unloading a second machine. In case of a 2-machine solution, the purchase costs for automatic loading/unloading are reduced.

The full productivity of the two machines remains unchanged.



EROWA Robot System and Robot Multi - reliable, flexible, modular

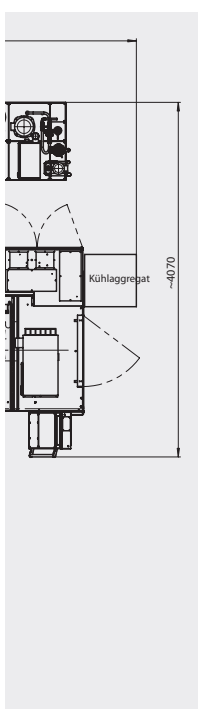
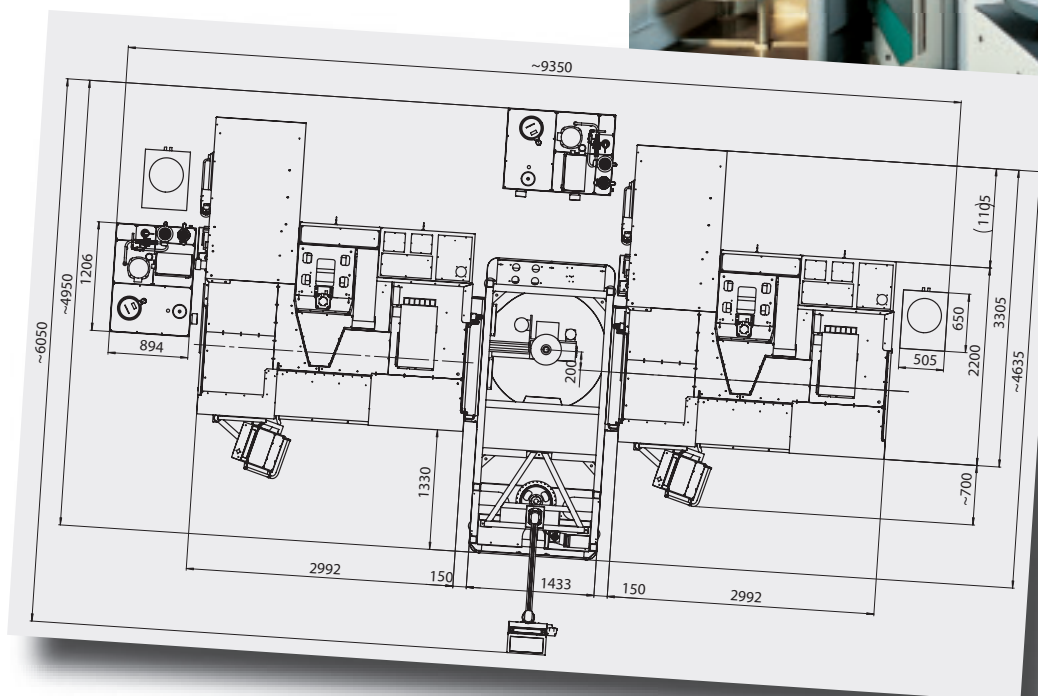
To be combined and upgraded at random. From the „basic“ model for a single machine with just one pallet type up to a versatile professional solution for two machines with different pallets and *magazine types (on Robot System).

The FEHLMANN Milling Center Manager maintains the control even with two machines.

PICOMAX® 95 - Robot Multi - PICOMAX® 95



With the clearly structured FEHLMANN MCM Job-table, the operator has a permanent survey even with two automation systems.





Control, record and monitor your automation systems efficiently by the FPM Software specially developed from FEHLMANN.
FPM has a modular concept. All modules are based on Windows and are easy and rapid to use.



FEHLMANN Milling Center Manager MCM™. To control and monitor the automation systems.

Ergonomically structured MCM operating panel

PC and operating elements are dust-protected.

The system status and condition can be monitored at any time, even if the screen of the CNC control unit is just being busy carrying out a graphic simulation or another task.

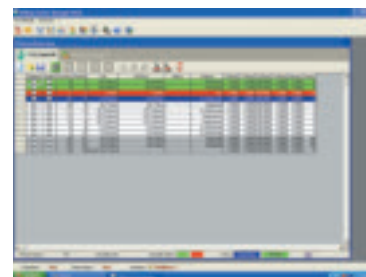


Particularly in the small and medium lot production as well as in tool and mould making, the software excels at its workshop capability. This will efficiently cut down on your downtimes. Machining order, zero points, etc. are entered in clearly structured job tables (Windows surface). The operating staff can easily change the order or individual parameters of the pending jobs during the system operation. For instance you may insert a workpiece with urgent deadline in the process flow with a simple mouse click. This keeps up your flexibility even in automatic operation.

Due to the high operator comfort of machine and MCM, the FEHLMANN solutions are not only perfectly suited for series production but just as well for small lot manufacturing starting from just a few parts.

Tool breakage control, NC program error monitoring, logging of the system events and the output of an alarm message on a pre-selected mobile number are just a few functions allowing for night-shift or weekend-shift operation without staff. Another asset is the "multi-machine skill". A central MCM controls and monitors several machines and robots.

The open system platform, based on a Windows application, allows for easy integration into the company network. On request also interfaces for the MCM are available to an external measuring place, to the JMS Pro- or another Job Management System.



MCM user interface.
Display of a job table.



Tool breakage

If all sister tools are used up, this tool is blocked. However, the MCM continues to use night-shift hours to produce all parts which do not use this tool.

The visual support of the MCM

For the loading/unloading process of the workpiece magazine, the part status (unmachined, successfully completed or defective) is displayed on the MCM screen.





FEHLMANN Status Messaging Module SMM™. Always up-to-date.

This module enables automatic sending of messages such as regular status announcements, error messages or other informations.

Reports can be released by means of

- failure on the machine
- time-dependent happenings
- occurrence of definable machine states

By means of configuration the software can extensively be customized and configured.

- Sending of messages per E-mail, SMS and NetSend.
- Messages can be sent due to user and time.
- NC programs can initiate an incident that send a message thereafter.



FEHLMANN Performance Monitoring Module PMM™. Production data recording, easy and well arranged.

With this module you can export several machine parameters into another program.

Data will be displayed and evaluated by means of Microsoft Excel or another customized program, thus the editing of data can be flexibly adjusted to your requirement.

- All operating data of an anytime free selectable time-frame will be readout. Categories:
 - Off
 - Stop
 - Produce
 - Set-up
 - Alert
- Visualizing of data in: yearly, monthly and weekly views.
- All data can be exported by Excel and therefore be freely processed according to customer requirements.



Control of the automation systems without MCM™ and other model versions.

For the exclusive production of series parts where flexibility and operating comfort are renounced in favour of a lower purchase price, we offer a simple solution: Pallet change is executed via one in the control integrated pallet file. A solution with two machines can only be realised with the FEHLMANN Milling Center Manager Software



Working process without MCM



Example with graphite suction and 3R-automation.



Other robot and clamping systems available upon request.