

Multiple awards



OUR PERFORMANCE
makes THE DIFFERENCE



Englisch - English Version 9.0

THE ORIGINAL 
Made in Germany

Tool change systems

Tool arena 4.0

Tool arena linear

Tool arenas with aggregate handling

NEW Compact arena

PATENT
by demmeler

Demmeler Tool Arena – The combination of power, efficiency and dynamics!

The advantages

- highest availability due to the integration of industrial robots which have been tried and tested thousands of times
- very high adaptability to various machine controls due to freely programmable PC-based systems
- large number of tools; up to approx. 500
- handling of all standard tool holders: HSK 100A / HSK 125B / SK50 / SK60 / CAPTO C6 / CAPTO C8; additional holders on request
- tools very large in diameter and length are possible; diameter up to 400 mm, bridge-type tools up to 800 mm, length of tools up to 1500 mm
- the number of tool places is retrofittable and can be upgraded
- shape and size of tool magazine can be adapted modularly to the machine
- short tool pre select time due to double gripper system, thus rapid change times
- time of tool change approx. 5 sec (depending on specification)
- very heavy tools, depending on type of robot, up to 150 kg; this makes it also possible to put in multi-spindle devices, angle heads, additional drive systems of HSC spindles
- tool change into various spindles possible – horizontally and vertically and in angle positions
- one unit for tool pre selection and tool change. In the case of smaller machines, it is possible to use the robot only for tool pre selection
- parallel grippers incl. measuring system make it possible to grip various types of tool holders within one magazine
- also possible: grippers in processing machines with several spindles and various tool holders

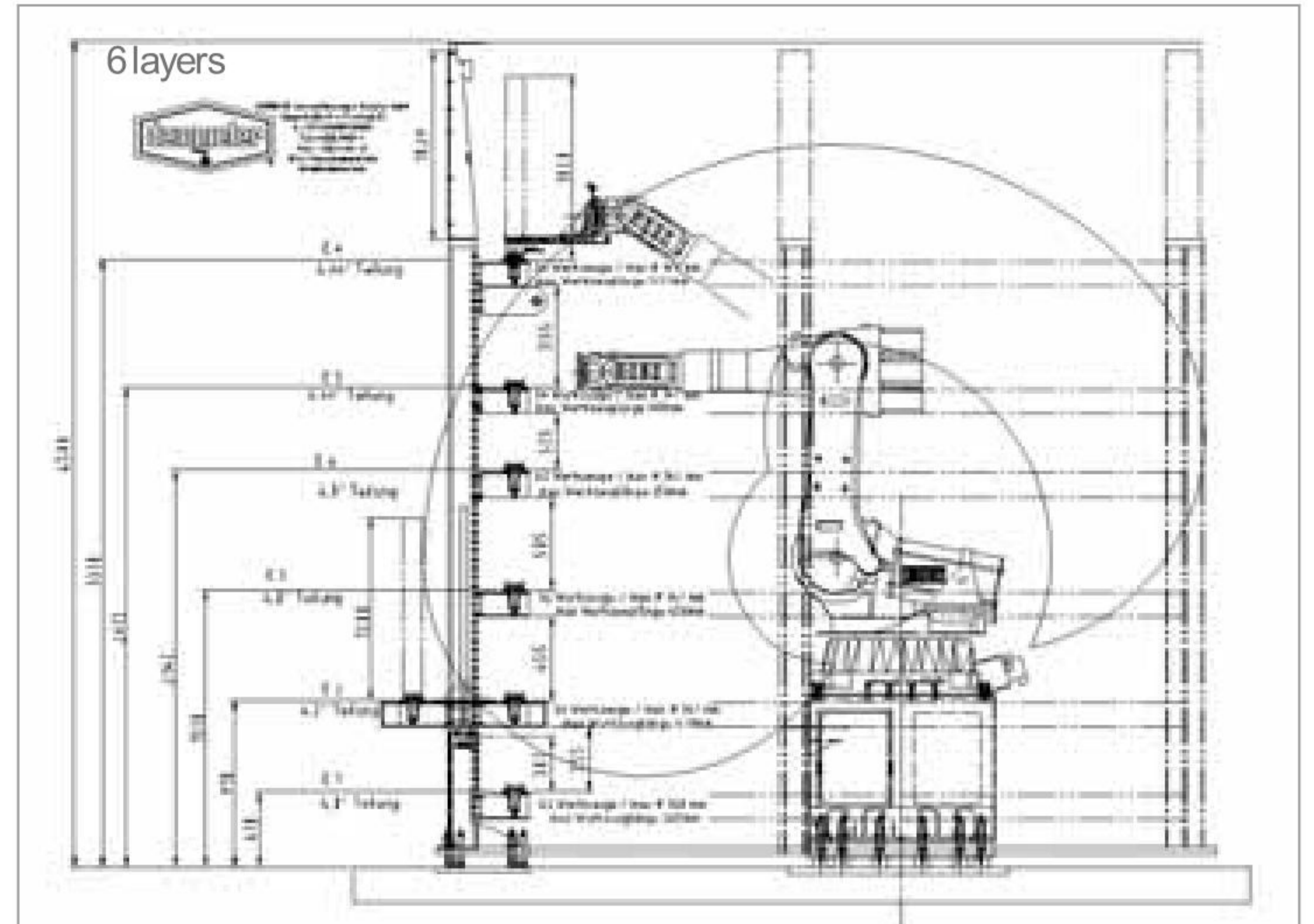


- quick and easy tool service due to storing and retrieving gate; the requested tools are automatically taken to the retrieving gate
- tool storing possible during primary processing time, i.e. the machine tool is in operation while at other tools inserts are exchanged or new tools are stored



6-axis standard industrial robot as tool magazine and changer at production machines

Height layout of a tool arena as example



Tool gate and Tool management

Modular design – unbeatably versatile

Segments for HSK-holders



Segments for SK-holders



Shelf segments for standard arena

The available shelf segments come with different divisions to be able to accommodate all standard tool holder types and sizes. Two different segment sizes, at 56° and 28°, are available. Special designs on request.

Division	4,0°	4,66°	5,6°	6,22°	7,0°	8,0°
Tool fitting-size						
SK 50 Collar 97,5 mm Max WZ-ø 140 mm	X					
SK 50 Collar 128 mm Max WZ- ø 160 mm		X				
SK 50 Collar 156 mm			X	X	X	
SK 50 Collar 221 mm						X
SK 60 Collar 156 mm			X	X	X	
SK 60 Collar 221 mm						X
HSK A 100 Max WZ-ø 140 mm	X					
HSK B 125 Max WZ-ø 160 mm		X				
Capto C8 Max WZ-ø 140 mm	X					

The max. flange or tool diameter provided, for the ticked segment division, can be side by side without blocked adjacent spaces.

Number of possible tool places per segment

Rack division	4,0°	4,66°	5,6°	6,22°	7,0°	8,0°
56°	14	12	10	9	8	7
28°	7	6	5	4	4	3



One of the most modern systems worldwide for manufacturing of large parts

Change options at the spindle



Tool change vertical



Tool change horizontal



Tool change at whatever number of degrees

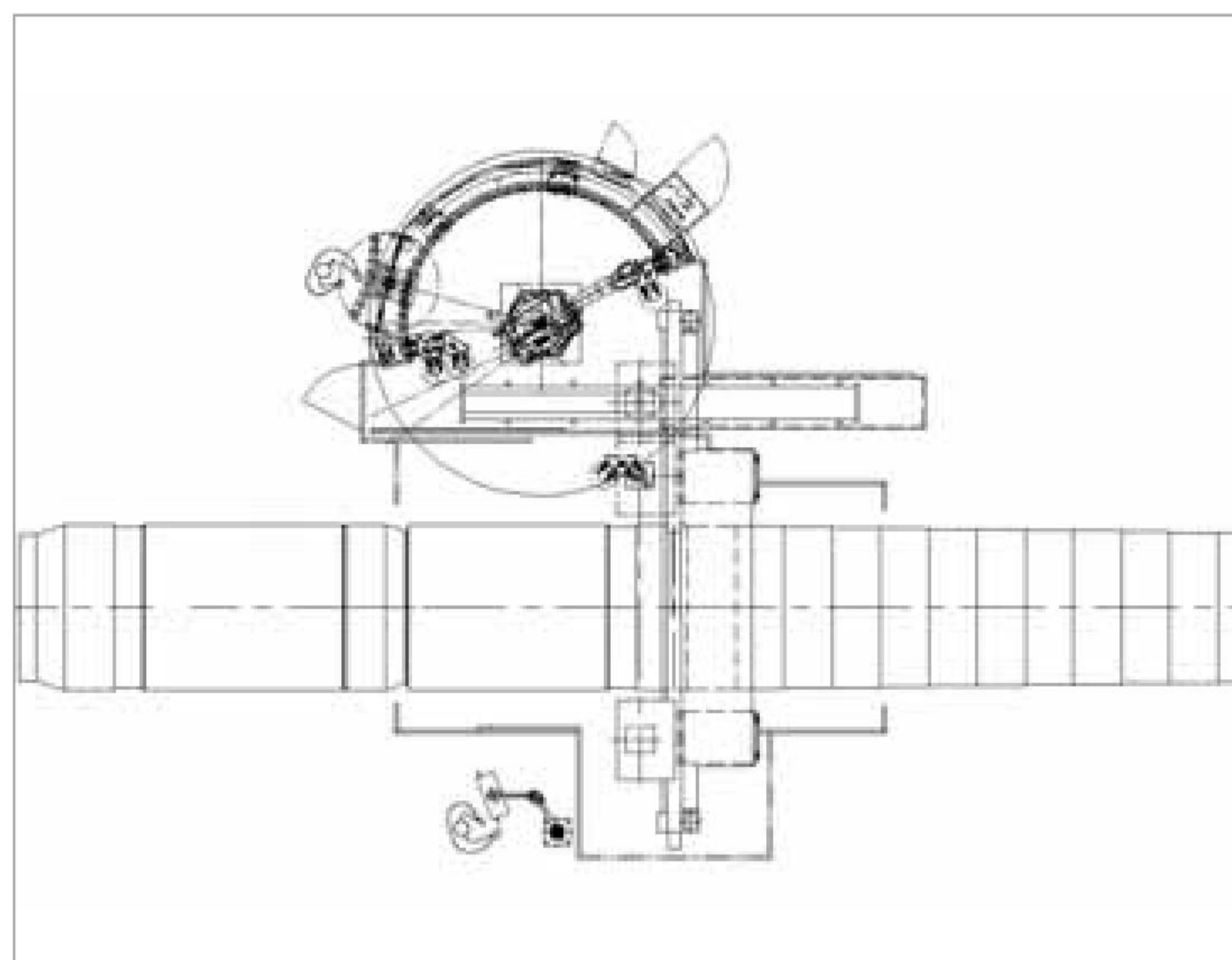
Exemplary solutions – by Demmeler

Tool arena

Portal-processing centre



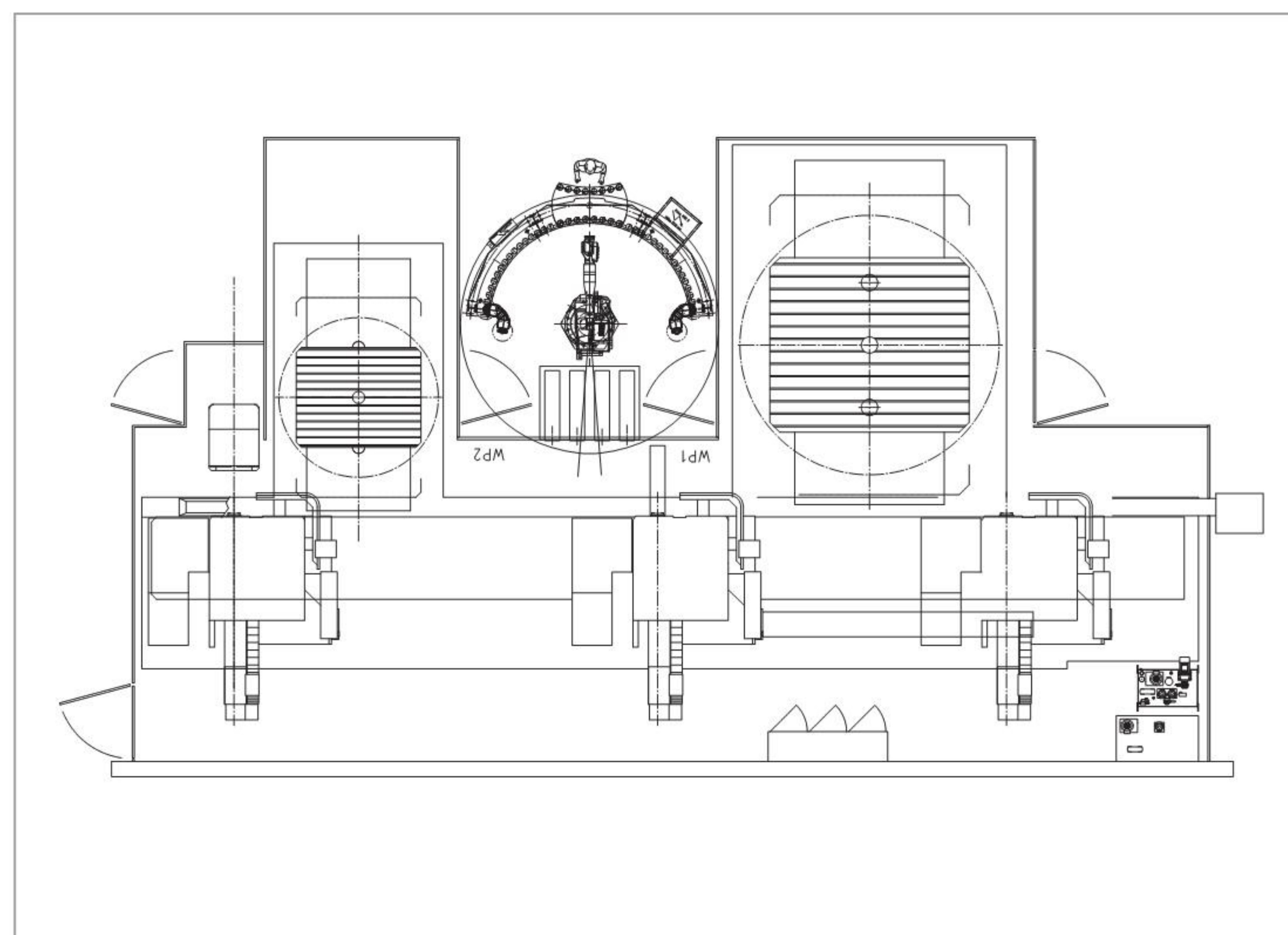
Tool capacity 280 pieces
Workpiece loading stations 16 pieces
max. tool length 1000 mm
max. tool diameter 400 mm
max. tool diameter (bridge-type) 800 mm
max. tool weight 100 kg

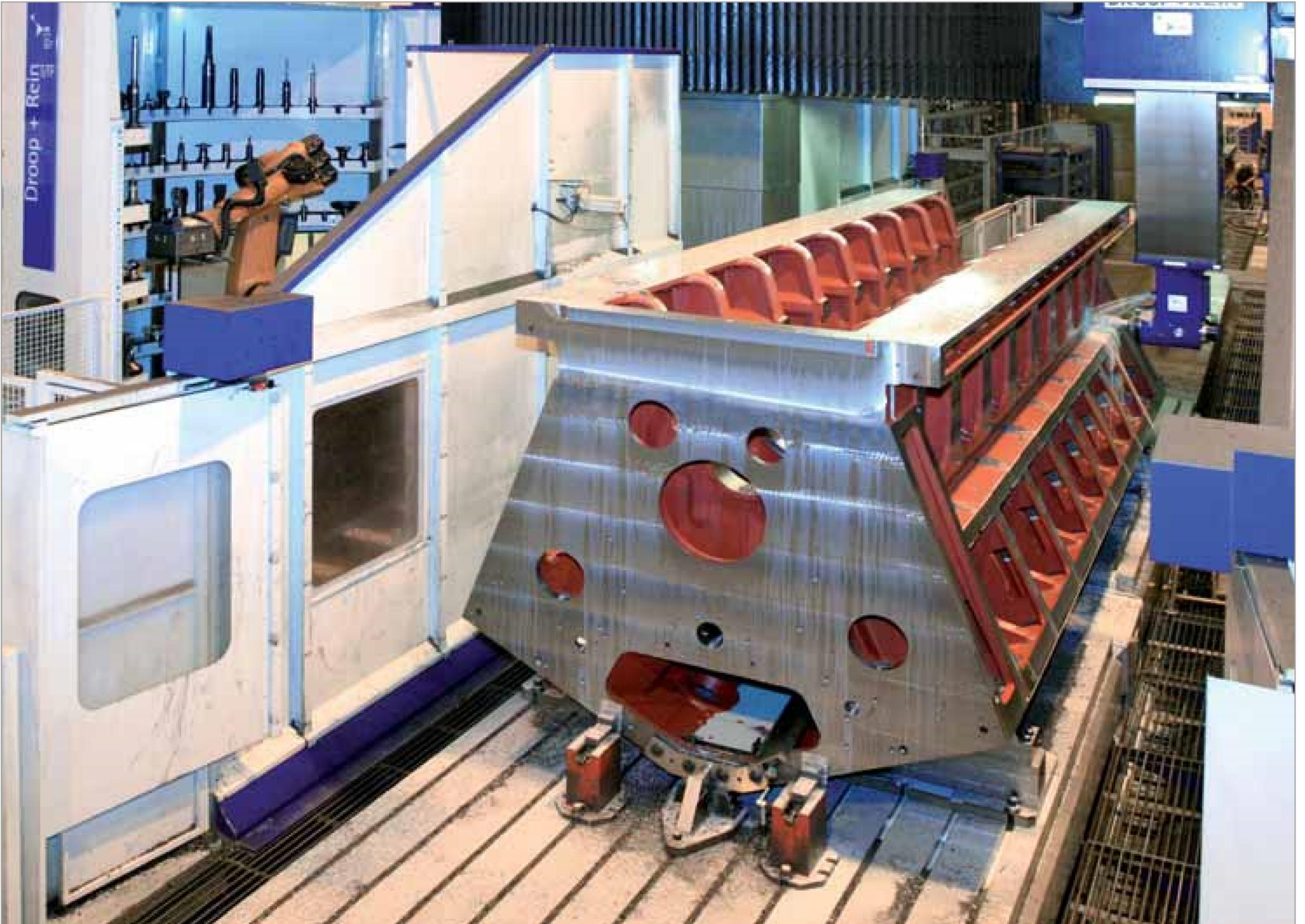


Moving column machining centre with fixed area and rotary table



- automated shuttle machining
- short changing times due to optimised space management





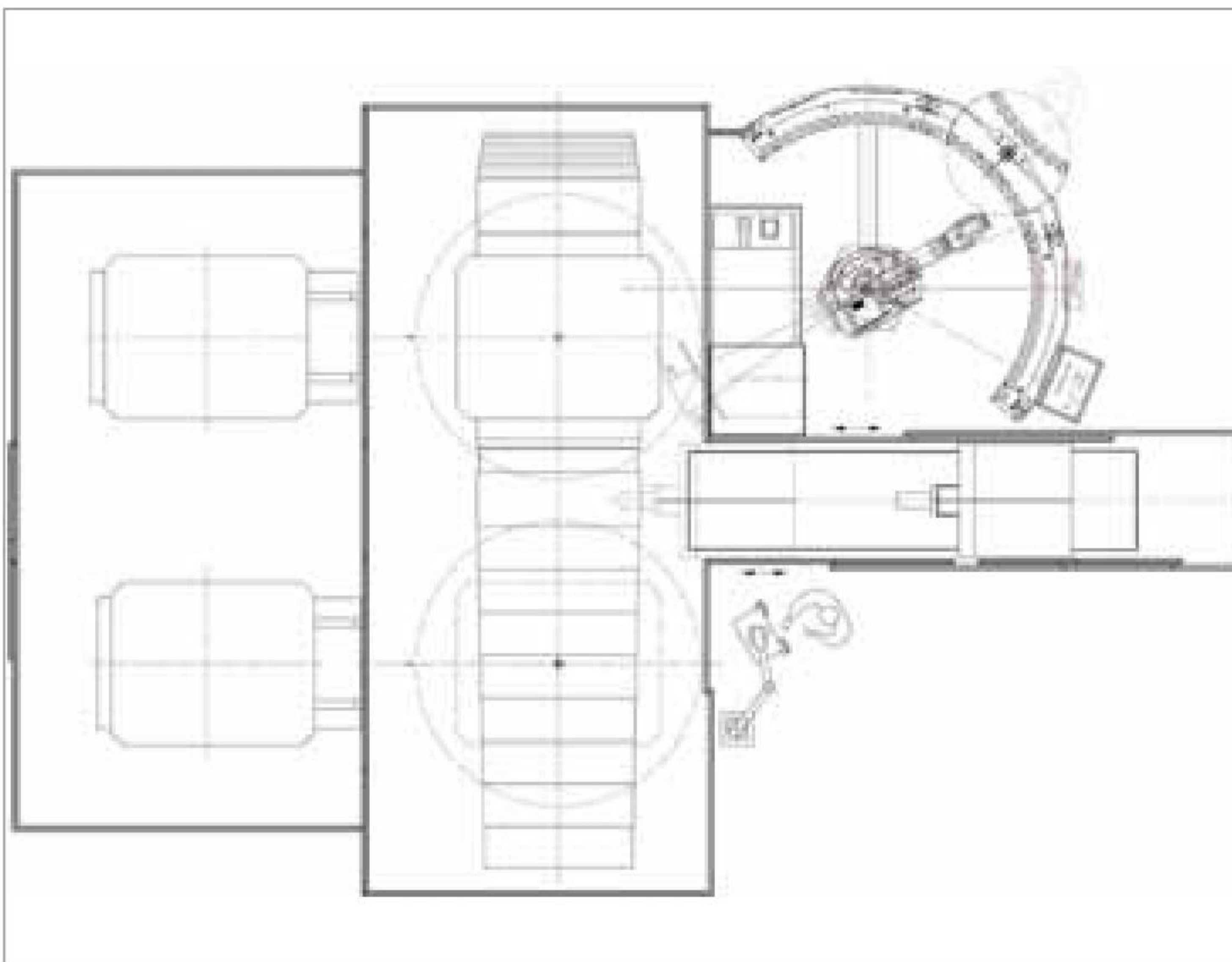
Tool arena 4.0 with proportional gripper



Proportional gripper in action

Exemplary solutions – by Demmeler

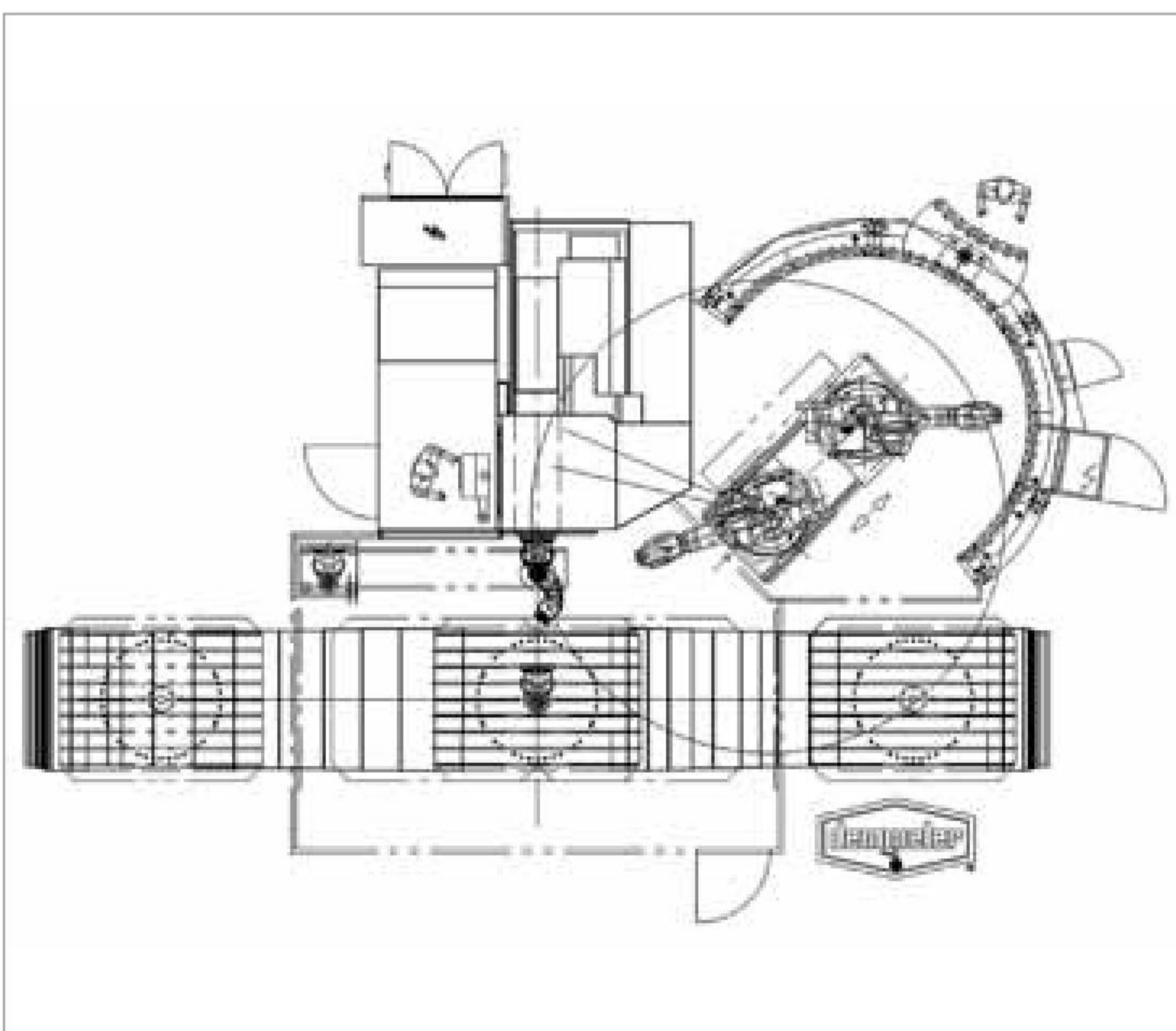
Horizontal machining centre with pallet change



Tool capacity	270 pieces
Workpiece loading stations	16 pieces
max. tool length	1000 mm
max. tool diameter	400 mm
max. tool diameter (bridge-type)	800 mm
max. tool weight	100 kg

Tool arena with short linear axis

- Movement path approx. 28000 mm
- traversing speed 80 m/min.

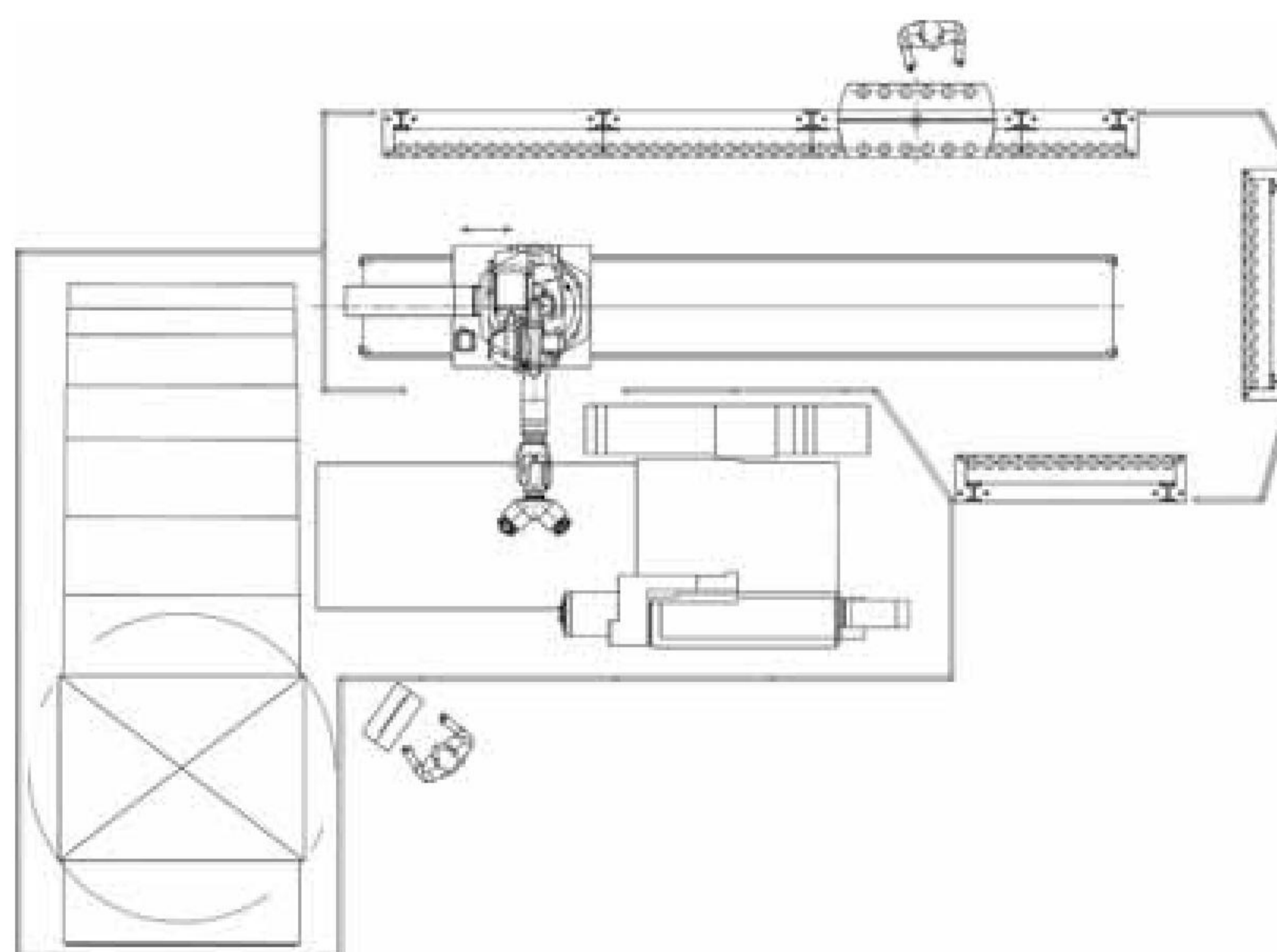


Tool capacity	450 pieces
Workpiece loading stations	10 pieces
max. tool length	1200 mm
max. tool diameter	400 mm
max. tool diameter (bridge-type)	800 mm
max. tool weight	120 kg



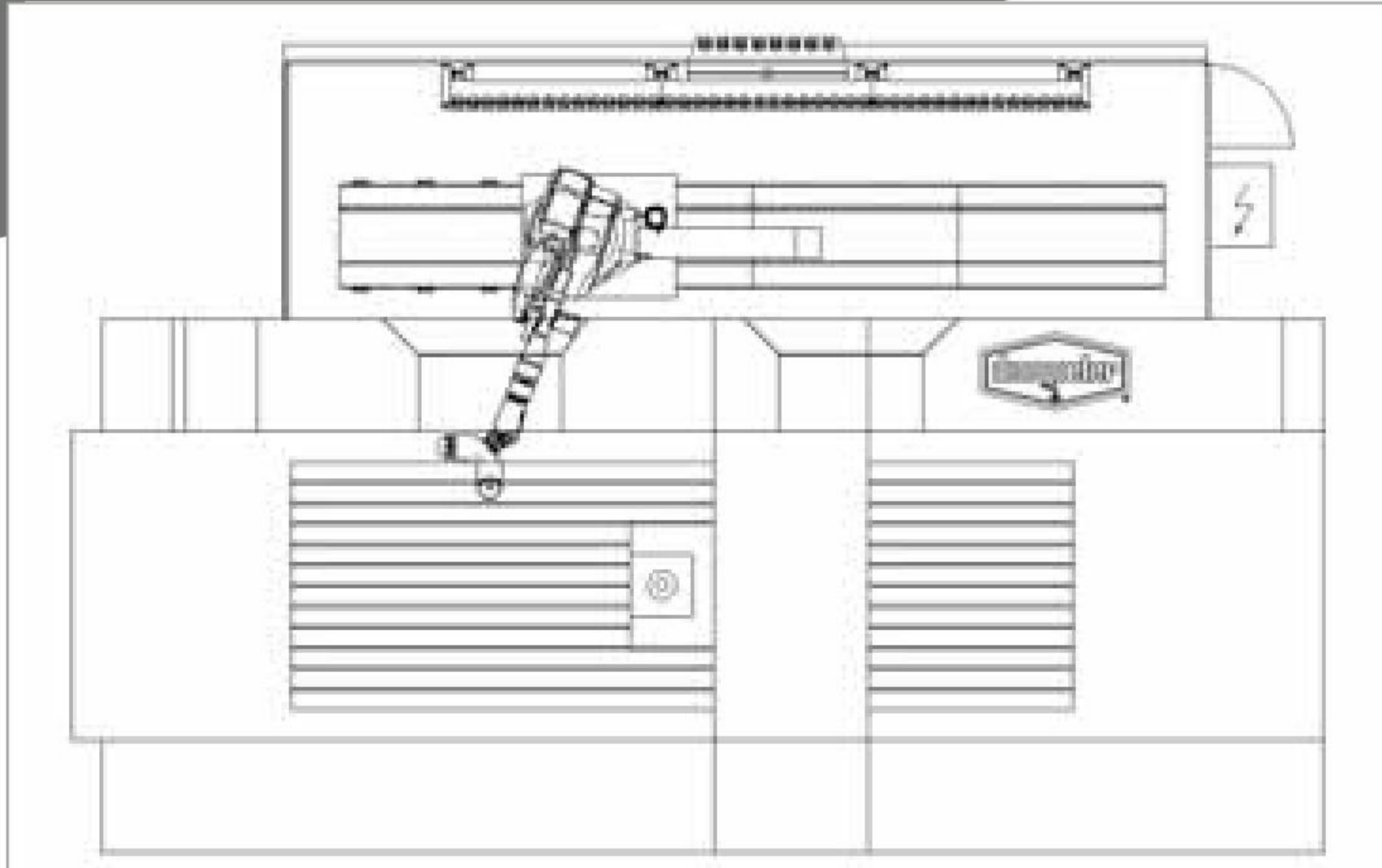
Tool arena linear with / without aggregate change

Tool arena linear without aggregate change



Room for 500 tools

Without aggregate change

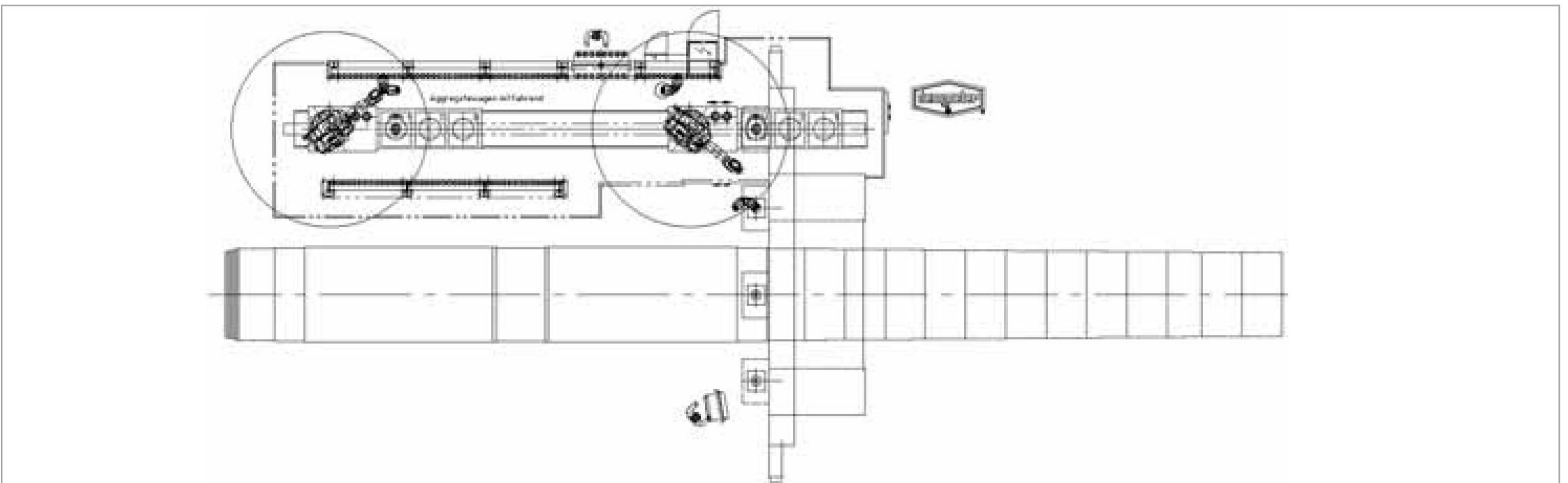


- Movement path according to shelf length
- traversing speed 120 m/min.
- Number of tools: up to 500 pieces

Tool arena linear with aggregate change

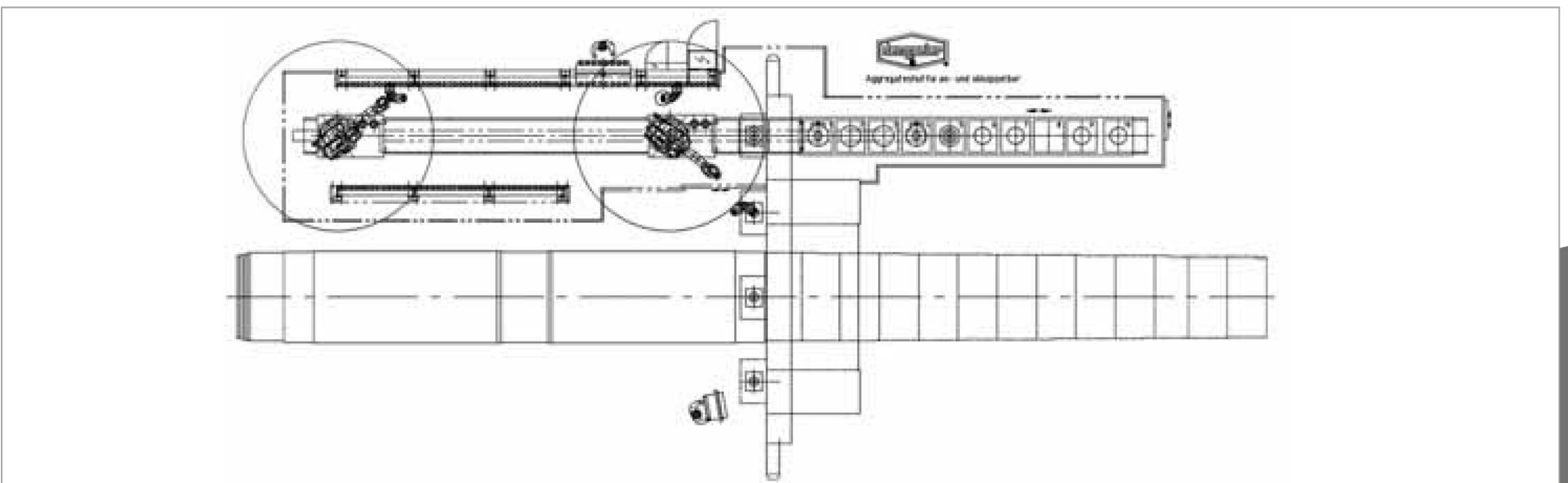
Up to 3 aggregates

- moving aggregates
- Movement path according to linear magazine length
- traversing speed up to 120 m/min.



Up to 10 aggregates

- moving aggregates on the linear axis of the robot
- Movement path according to linear magazine length
- traversing speed up to 120 m/min.
- Also available as independently moving aggregate slide, hence tool change independent of aggregate change

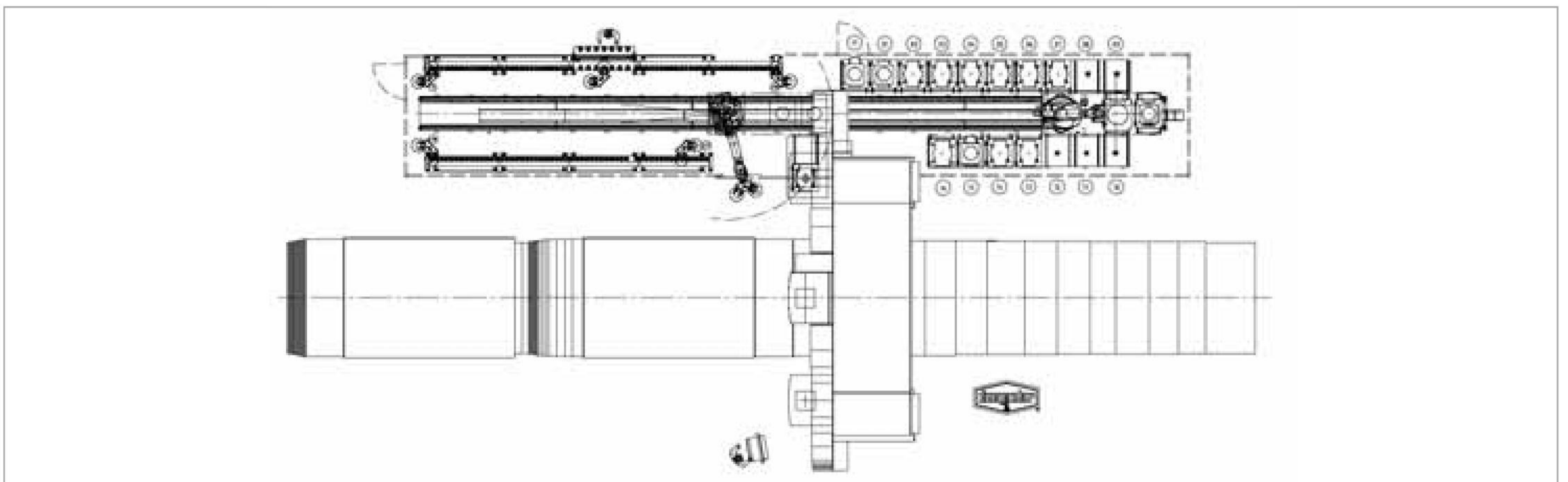


Enough space –
for your aggregates

Bright brains – make it possible

Up to 20 aggregates

- SK 50 and SK 60 total number approx. 500 pieces
- with unit station
- Movement path approx. 22000 mm
- traversing speed 120 m/min.
- two mobile shuttle places





Compact – and flexible for series machines

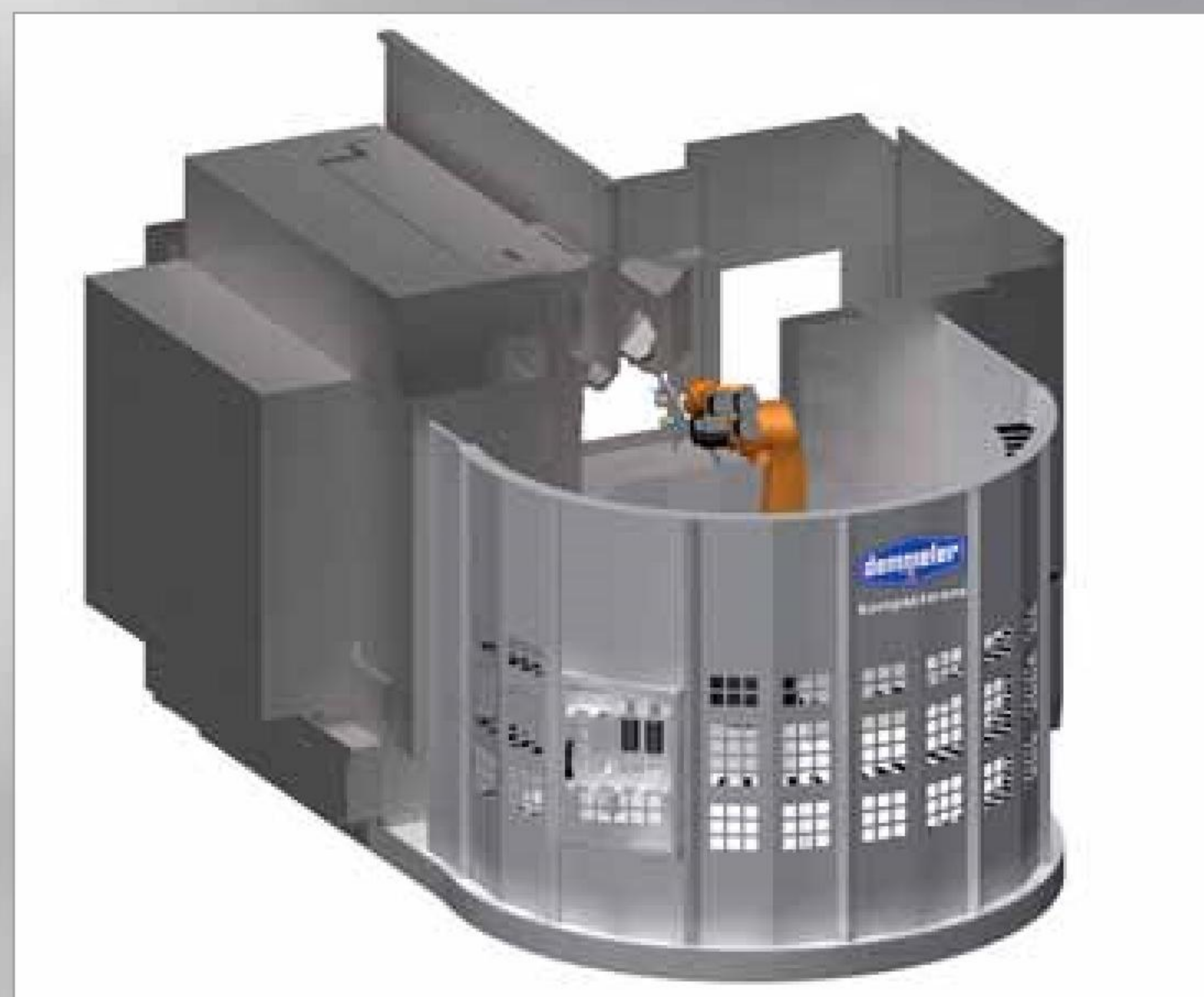
Benefits of the DEMMELER compact arena

- less space required than for standard arena / Segment radius approx. 1600 mm
- easy installation of shelf with integrated base
- different robot types to choose from, depending on application and load
- Single row or double row shelf unit design
- Handling of all standard tool holders is possible:
HSK A 63, HSK A 100, SK 40, SK 50, Capto C6, Capto C8
- tool diameter 120 mm without blocked adjacent spaces
- max. tool diameter 240 mm
- Tool weight up to 15 kg in exchange / spot replacement up to 30 kg
- tool storing possible during primary processing time
- quick and easy tool equipping due to integrated revolving sluice
- completely enclosed housing in shelf area incl. inspection window
- short tool pre selection times thanks to parallel gripper
- shelf size and angle can be matched to the machine
- optional housing upgrade is possible, all the way up to machine cladding



Compact gripper for a flange diameter
Gripping in gripper groove

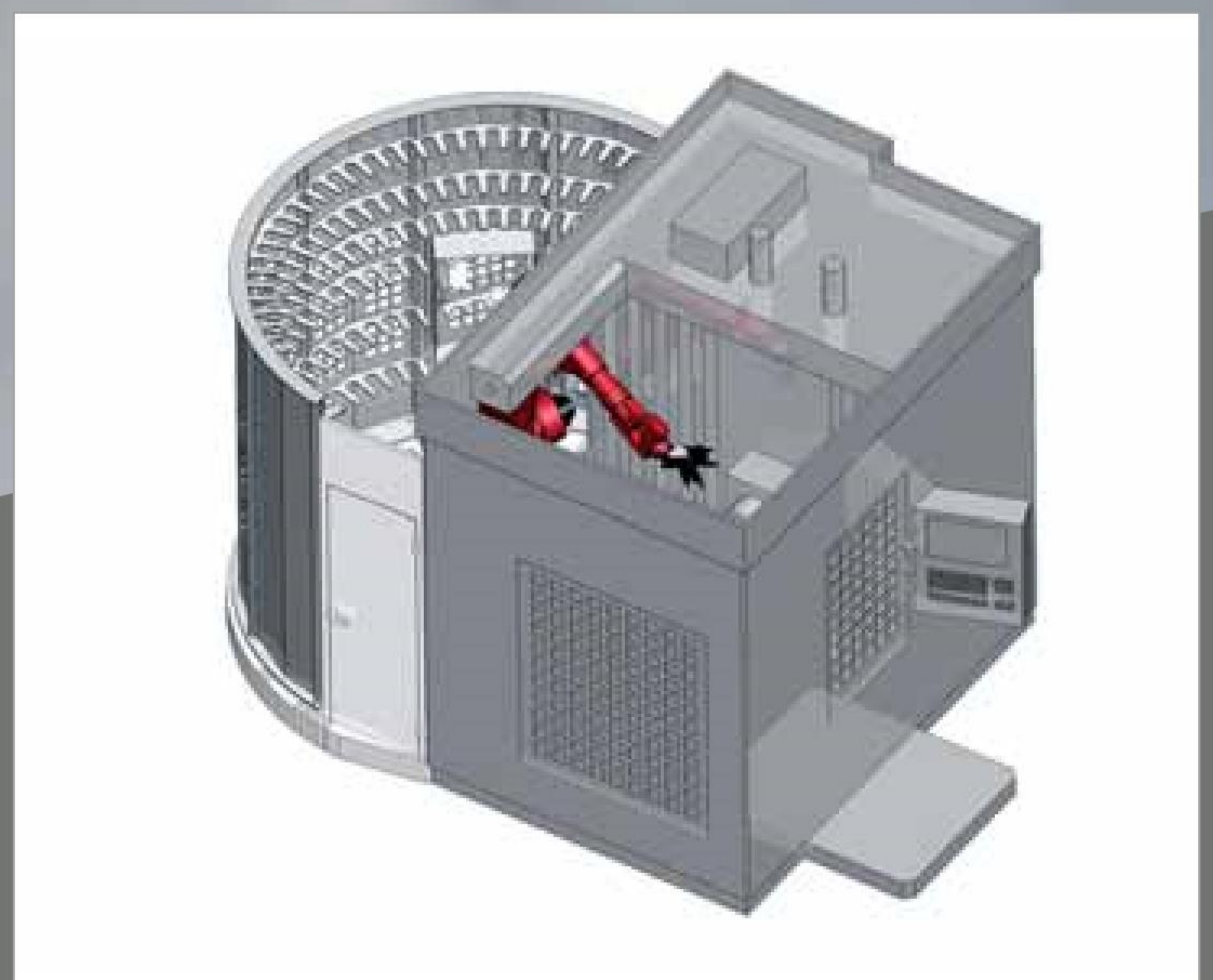
Gripping directly at the mating cone



Exterior view with revolving sluice



Interior view with double row shelf segments

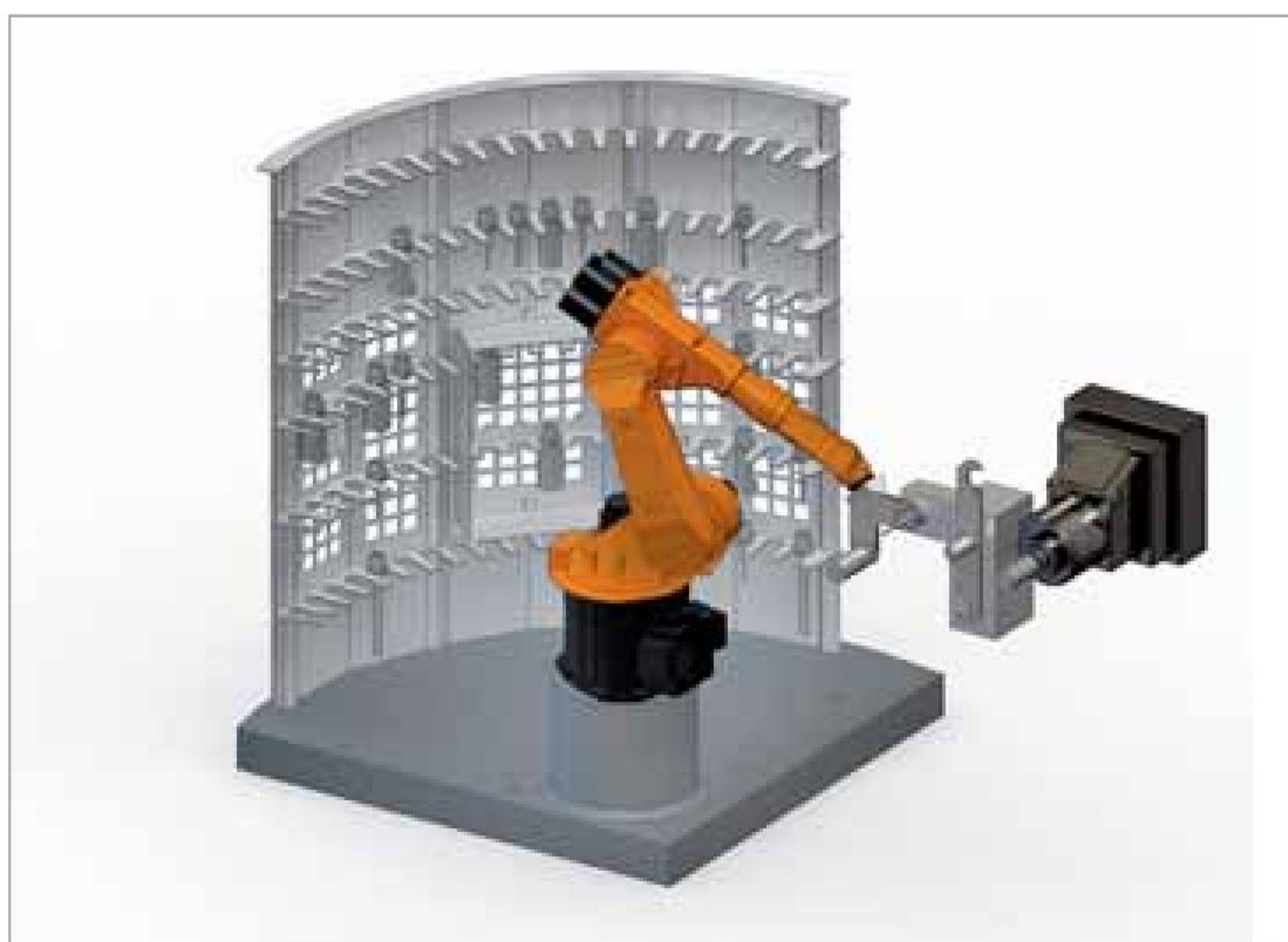


Compact arena at Horizontal-BAZ

Be there – in the front row

Tool change situations

NEW



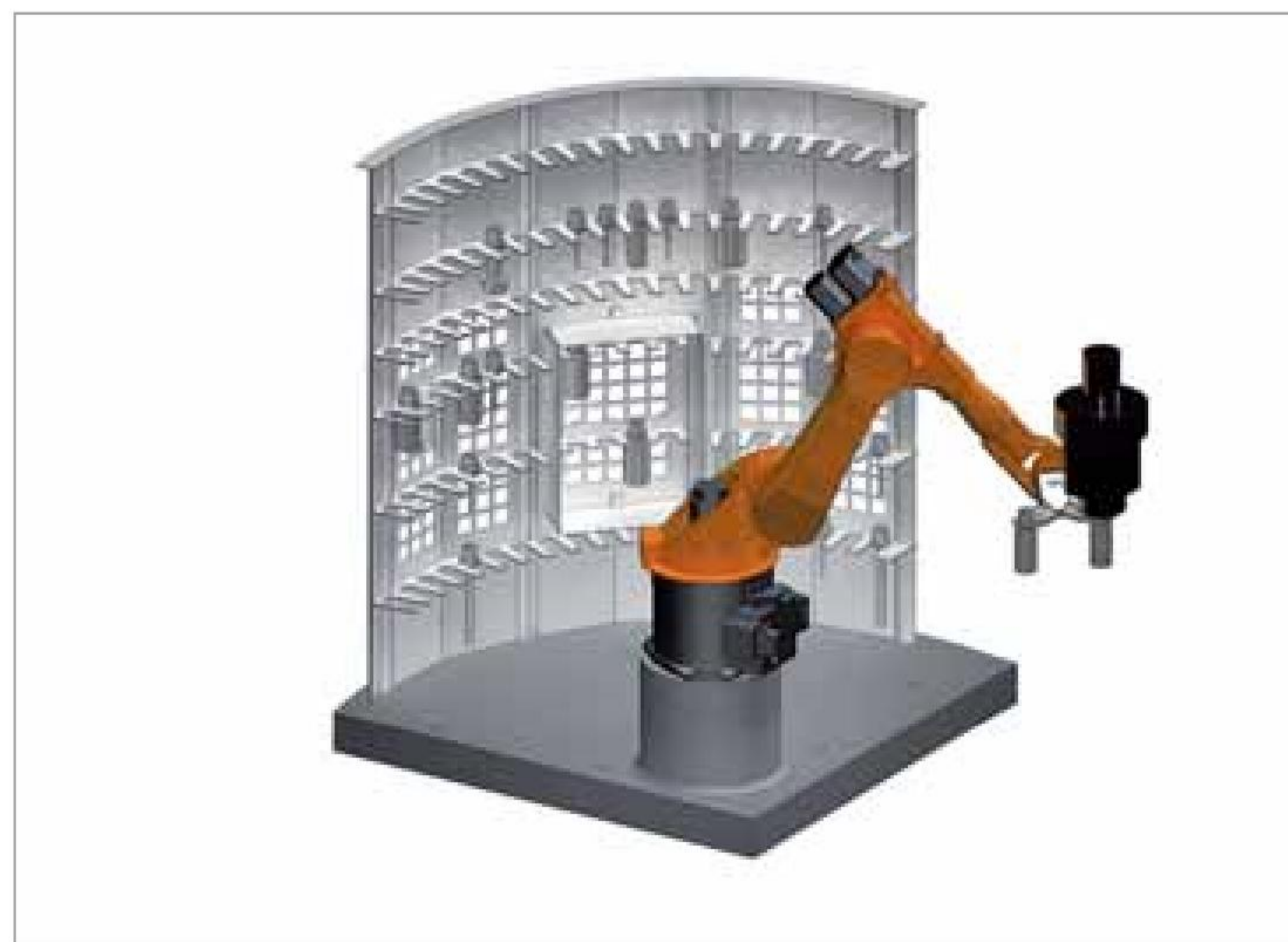
Tool pre selection in pre selection position



Tool change directly in double arm



Horizontal tool change directly in machine spindle



Vertical tool change directly into machine spindle

Dimensions

NEW



Shelf double row



Shelf single row

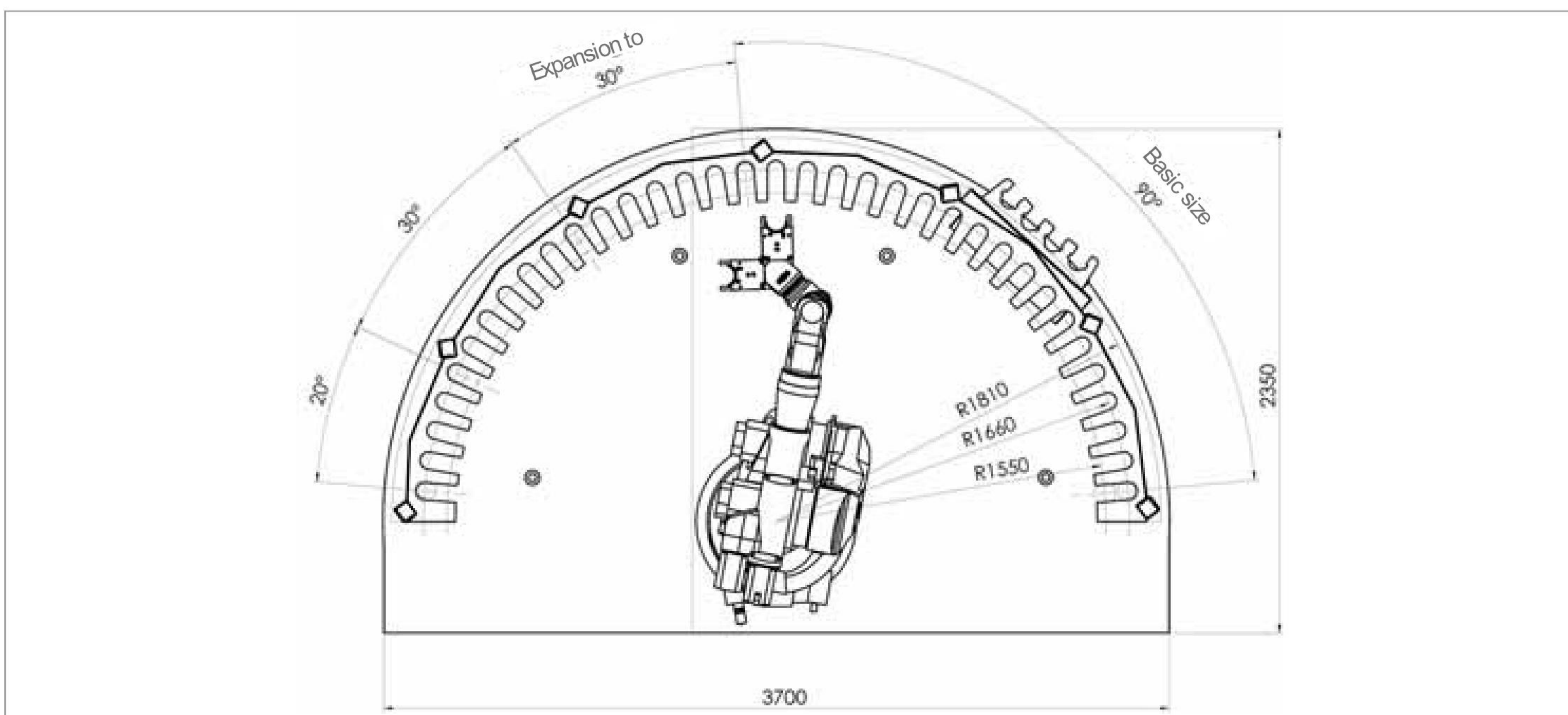


Illustration: double-row version

Arena size and number of places

	6 levels, single-row	6 levels, double-row	positions per level single row/ double-row
Basic range 90°	102 Positions	216 Positions	19 / 38
Expansion to 120°	138 Positions	288 Positions	25 / 50
Expansion to 150°	174 Positions	360 Positions	31 / 62
Expansion to 180°	198 Positions	408 Positions	35 / 70

Diverse applications thanks to optional configuration levels!

Options:

Robot gripper				
Gripper	Grip diameter	Total pliers Force	Tool fittings	Max. tool fittings
Compact gripper	63 / 80 / 97,5 oder 100 mm	10 mm	HSK63 / Capto C6 / C8 / SK40 / 50 HSK 100	250 mm / 400 Bridges
Standard gripper	97,5-128 mm	30,5 mm	SK50 / HSK100	400mm/800 Bridges
Standard gripper	63-100 mm	37 mm	Capto C6 / HSK63 / Capto C8 / SK40	400mm/800 Bridges
Proportional gripper	97,5 - 221 mm	123,5 mm	SK 50 / SK 60	400 mm / 800 Bridges

special gripping pliers on request

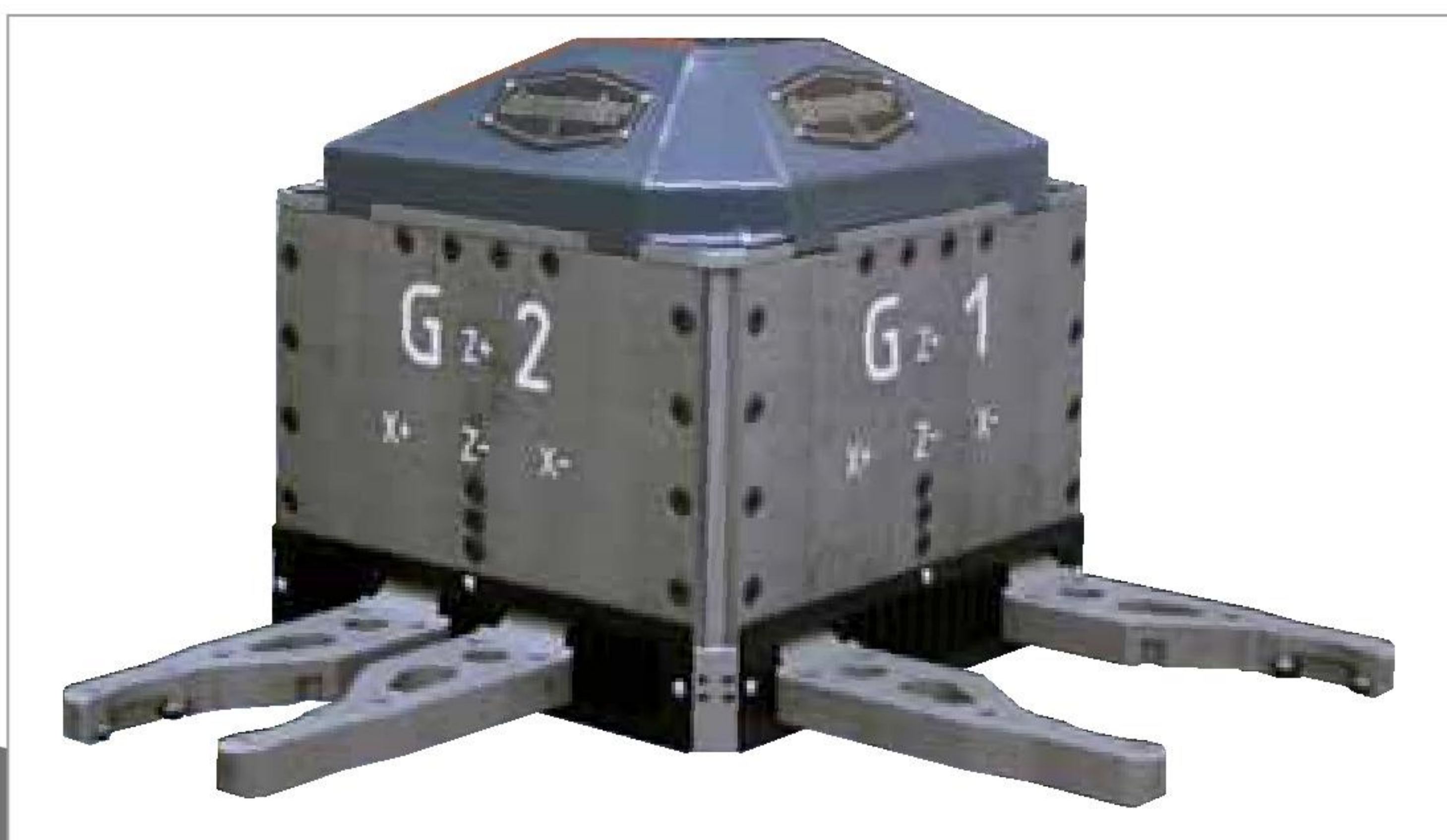
Compact gripper (for one flange diameter)



Standard gripper (for two flange diameters)



Proportional gripper with integrated measuring systems



Cleaning unit for machine taper:

NEW



- With rotating Satellite brushes
- compressed air nozzles



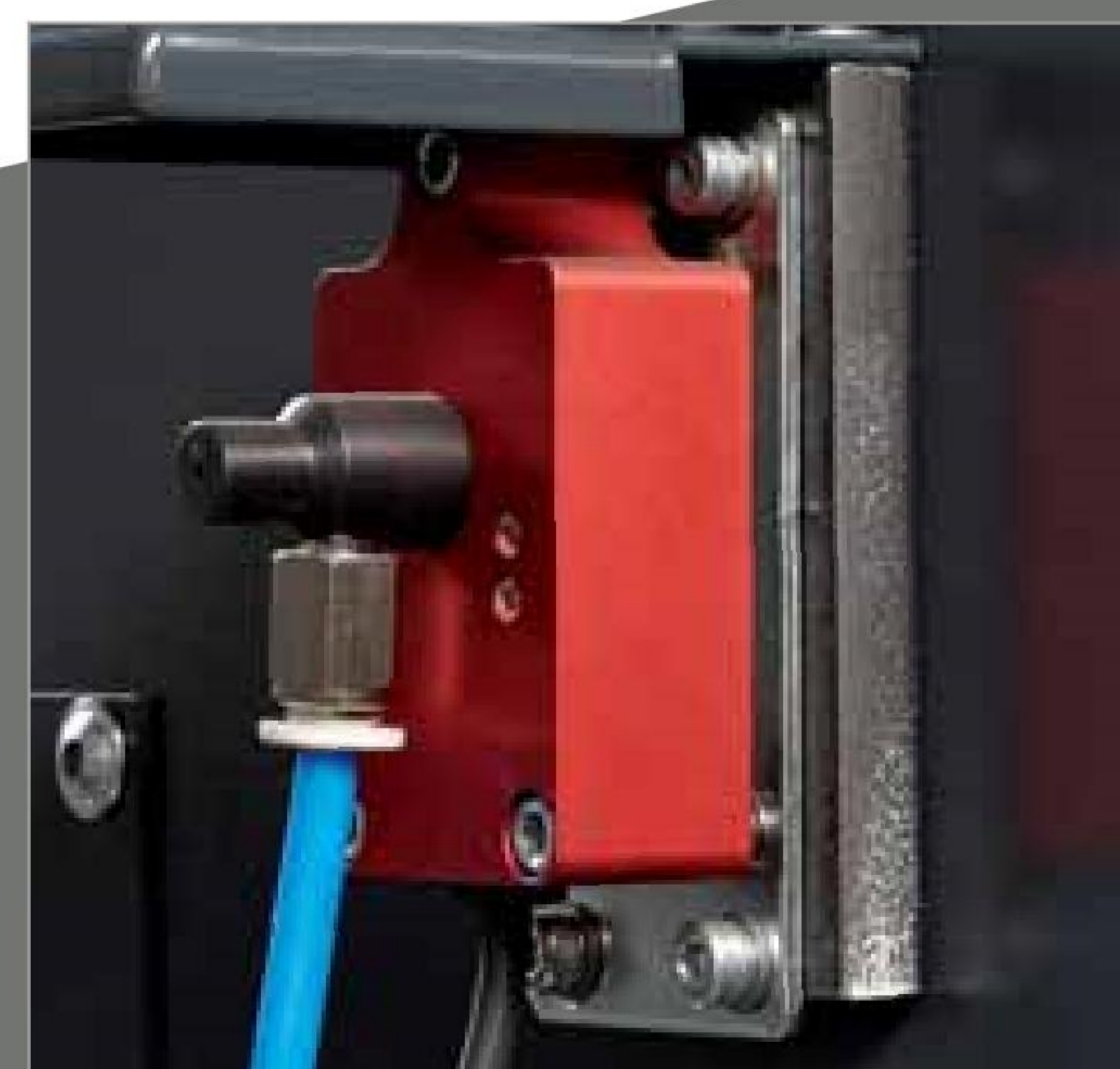
Cleaning unit for machine taper cleans the tool shaft; This results in higher precision and concentricity of the tools. Available for all standard tool holders.

Cleaning stations are available for nearly all tool holders and flange sizes:

Collar size	Capto	HSK	HSK BIG	SK 50	SK 50 BIG	SK 60	SK 60 BIG
Ø6	X						
Ø8	X						
Ø63		X					
Ø100		X					
Ø100 - 125			X				
Ø97,5 - 128				X			
Ø97,5 - 156					X		
Ø97,5 - 221					X		
Ø156						X	
Ø156 - 221							X

Control of tool breakage:

Control of tool breakage by means of laser light barrier increases the safety of the process. In this way, downstream tools can be protected against damage. The control is performed during primary processing time.



Well equipped for new tasks ... with Demmeler

Option:

gripper sensor for HSK-spindles:

For checking the precise position of the robot gripper and/or the tool in the spindle.
Use in the case of missing machine-sided monitoring of the tool clamp.



Hydraulic aggregate in robot base:

A compact system construed for the size and functionality of the robot gripper for the supply of the robot gripper with the necessary hydraulics:

- integrated pressure switch
- pressure accumulator
- level control

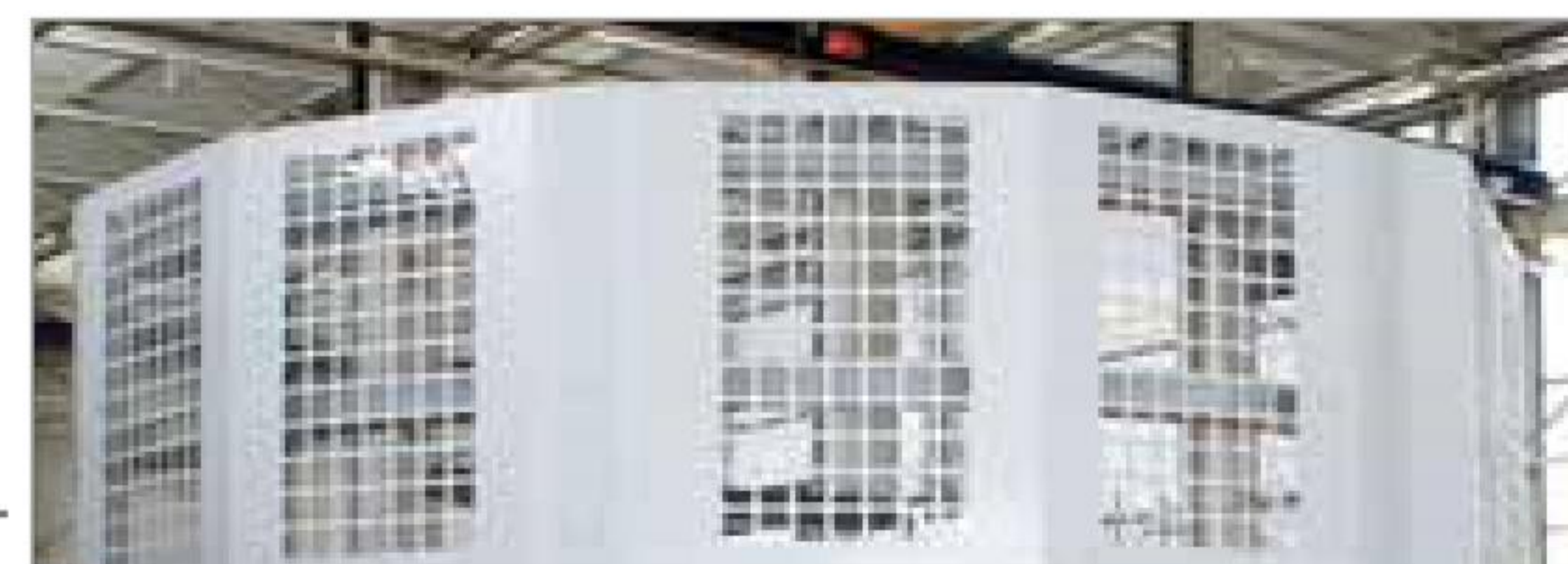
Only required if no hydraulics can be provided on the machine side.



Additional inspection windows in housing:

Provides better visibility in the entire arena, so the operator has greater control over the stored tools.

Inspection windows
Optional



Inspection windows
Standard



Housing with change and/or service door

Optional extensions of the arena housing: with an annular wall, complete with integrated tool change door.

- With linear guide
- rack/pinion drives
- Drive with electric motor or pneumatic cylinder integrated in the robot control unit
- vertical or horizontal opening movement possible



Tool change door



Service door

Roof ring and/or roof above arena:

Roof ring over the tool places with a width of 600 mm. Completely closed roof prevents soiling of tools and of the complete robot and/or shelf area.



Roof ring



completely closed roof

Storing – as you wish

Tool change gate:

The number of storing and/or retrieving places on the gate depends on customer requirements and/or the desired options.

- Standard number 2 x 8 places per side with integrated plastic inserts
- tool storing possible during primary processing time
- equipping of retrieved tools when machine is running



Plastic inserts available for all standard tool holders.



Tool change hatch:

The number of storing and/or retrieving places is limited to 6. Here, too, various options are available, for instance tool identification by means of data chip.

- Standard number 1 x 6 places with integrated plastic inserts
- tool storing not possible during primary processing time
- equipping not possible when machine is running



Tool identification by data chip in the tool change gate:

A unit integrated in the tool change sluice for tool identification by write/read heads. Various versions available according to customer desire.

Number of possible tool spaces as follows: from 2 x 4 to 2 x 8 spaces.

The system can optionally be combined with the tool administration available from Demmeler.

Prior to passing the storing and/or retrieving gate, the tools are scanned on the gate places or are labelled before the robot stores or retrieves the tools.



Tool identification

Tool identification by data chip in the robot base:

A unit integrated in the robot base for tool identification by write/read heads. The robot moves with the tool to the write/read place. The tool data is read and/or labelled prior to retrieval and/or storage



presence monitoring in tool change gate:

System for presence monitoring for all places, integrated into tool change gate. The number of tool places possible depends on the design of the gate/sluice. This option is available for all standard tool holders.



Modern software control for comfortable use!

Demmeler tool administration

The principal mask shows all basic functions

The principal mask shows all basic functions such as tool list, survey of the storing and retrieving gate and status of the tool places.

Sorting options of tool list:

- by location
- by state
- by orders

The screenshot displays the Demmeler TOOL-MANAGEMENT software interface. At the top, there are control panels for 'Werkzeugliste' (Tool List) with filters for 'Aufenthaltsort' (Location), 'Zustand' (State), 'T_Nummer' (Tool Number), and 'Auftrag' (Order). The 'Zustand' panel shows options like 'gespart' (saved), 'gebrochen' (broken), and 'abgelaufen' (expired). The 'Auftrag' panel shows 'Auftrag aktivieren' (Activate order), 'Auftrag deaktivieren' (Deactivate order), and 'Auftrag auslagern' (Remove order). The Demmeler logo and 'TOOL-MANAGEMENT' text are in the top right.

The main section is a table with columns: 'Lagerplatz' (Storage location), 'T-Nummer' (Tool number), 'Duplo' (Duplicate), 'Bezeichnung' (Designation), 'Aufenthaltsort' (Location), 'gespart' (Saved), 'gebrochen' (Broken), 'verschlissen' (Worn), and 'abgelaufen' (Expired). The table lists several tools with their respective details.

Below the table is the 'Schleuse' (Gate) control section, featuring 'Einlagern' (Load) and 'Auslagern' (Unload) buttons. It includes a grid of buttons for 'Robotersseite' (Robot side) and 'Bedienseite' (Operator side). A 'Chip lesen/schreiben' (Read/Write chip) progress bar is shown at 8%. A legend at the bottom left defines various status icons like 'kein Chip', 'Kollision', 'manuell', 'falsche ID', 'Chip lesen', 'frei', 'Drehen ok', 'halb gespart', 'ganz gespart', and 'belegt'. Status indicators for 'Status KUNA' and 'Status WZV' are also present.

The 'Meldungen' (Messages) section on the right shows a log of events, such as 'Werkzeug wird aus Spindel geholt' (Tool is removed from spindle) and 'Werkzeug wird gereinigt' (Tool is cleaned).

Integrated control on state-of-the-art Windows basis

- easy to operate graphic user interface
- high machine availability due to intelligent robot control with system of priorities
- tools can be exchanged (individual tools, complete cassettes, carriages) during primary processing time
- automatic space-optimised storing, thus high tool density in magazine
- damaged tool strategy
- sister tool strategy
- short chip-to-chip time possible thanks to flexible changing point

The simple networking of the controls by means of PC networks results in a large number of possibilities

- several monitors and input possibilities for the control of the system; also to be performed from the machine
- integration of external tool administration – and programming systems
- clear correction of the tool parameters
- exclusion of the complete tool data from the NC-control is possible
- automatic programme transfer to NC-control via network with adjustment of tool data
- thanks to database systems, sorting is made easy i.e. by:
 - length of operational time
 - damaged tools
 - tool type
 - designated use (NC-programme)
 - length and diameter
 - adjustment of tooling sheet
- upgradeable to complete tool administration
- tool management
- simple data protection, as system works with database
- video control of the tool change system

Bound to be successful with the help of state-of-the-art software control

- Management
- Administration
- Control

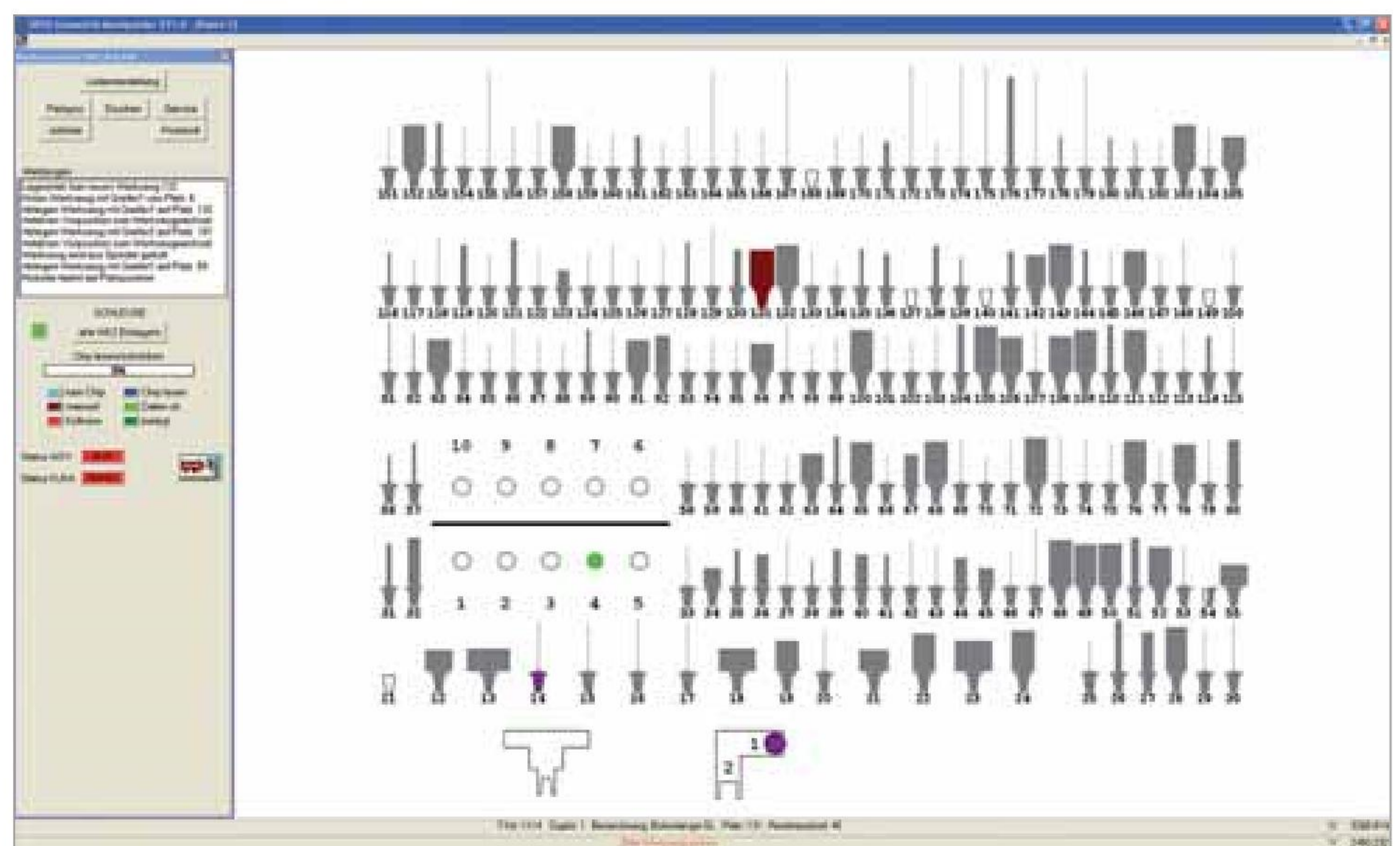
All data under control – extremely simple control of complex processes!

All tool-specific data can be entered in the tool data sheet. Additionally, the definition of options is possible.

- Cleaning status
- Tool breakage control
- Operational time
- Warning limit

Graphic illustration of the complete tool magazine

Pre-defined tool types can be shown in a roughly realistic manner on the monitor. This increases clarity and simplifies the search for certain tools or tool types. Blocked shelf areas are identified in colour.



Various display options in Demmeler tool administration

Here, the target and the actual data of the required tool in the shelf are displayed.



Terminal tool administration

Tabular representation of entire tool magazine

Display of the shelf occupancy of the entire tool magazine. Optionally, space for tools can be reserved or blocked here. The arrangement of the shelf levels is also displayed here.

Turn OLD – into NEW

RETROFIT – Give your machine new dynamics

Examples for innovative solutions

Tool arena at Portal-BAZ

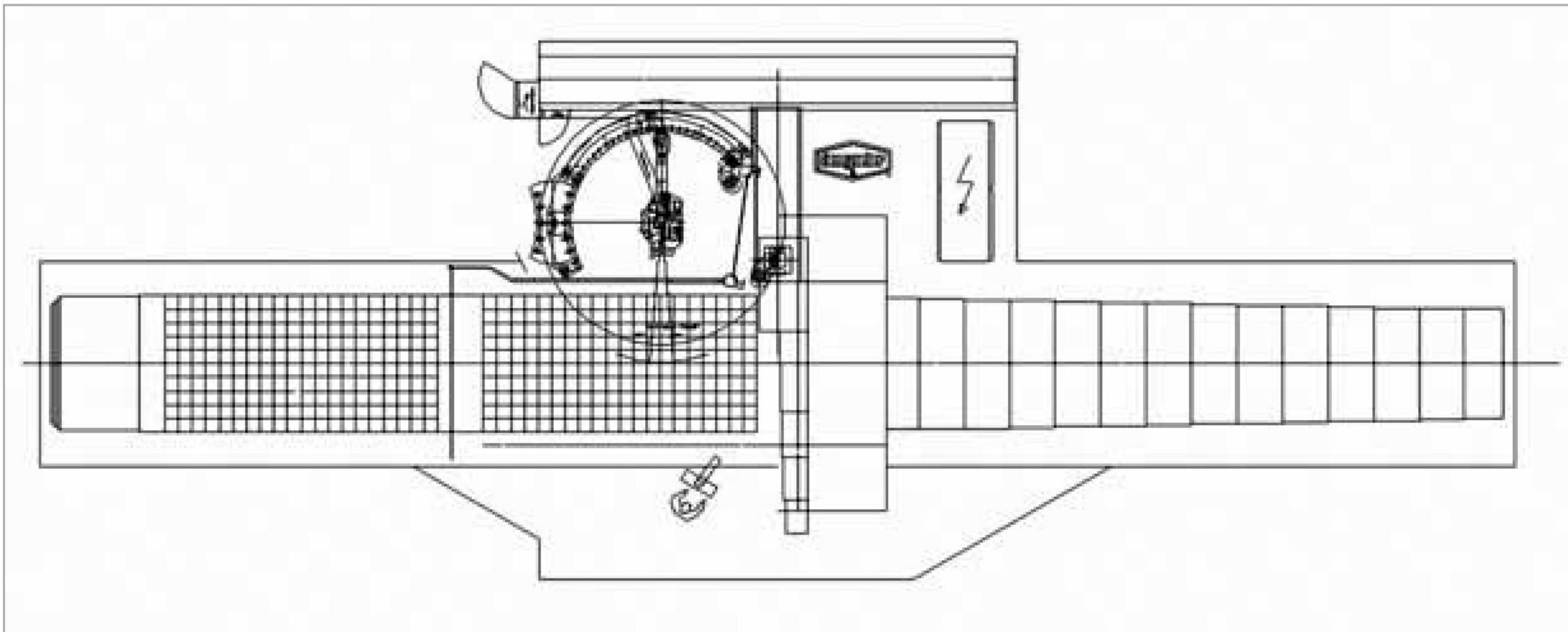
The task was to replace, at an obsolete machine, the trouble-prone and slow tool changer with a new, fast and efficient solution in order to render the system more productive. The machine was overhauled and, with a DEMMELER Tool arena, upgraded to be a perfectly functioning, economically efficient unit once more, which will be able to meet all the demands placed on it for the next few years, too.



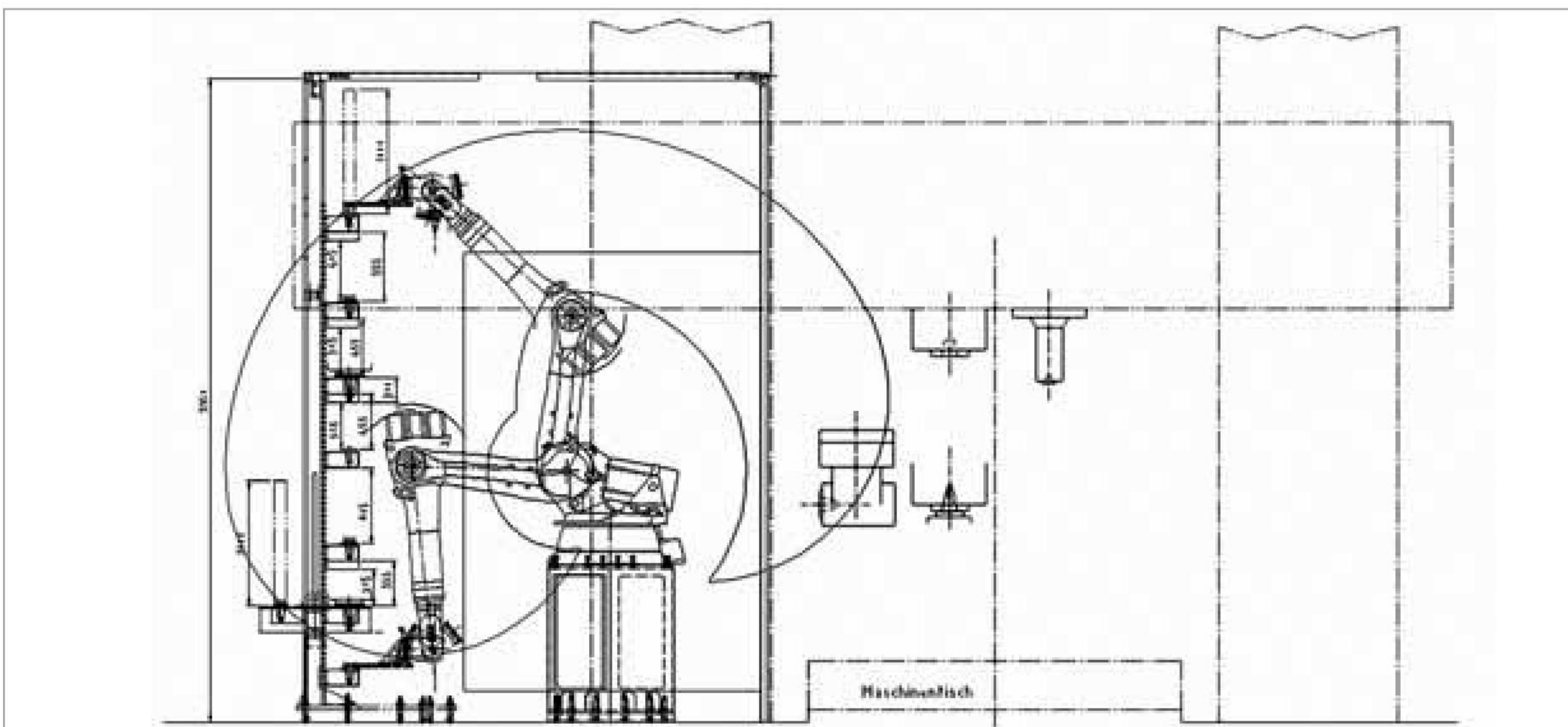
Before



After



Top view

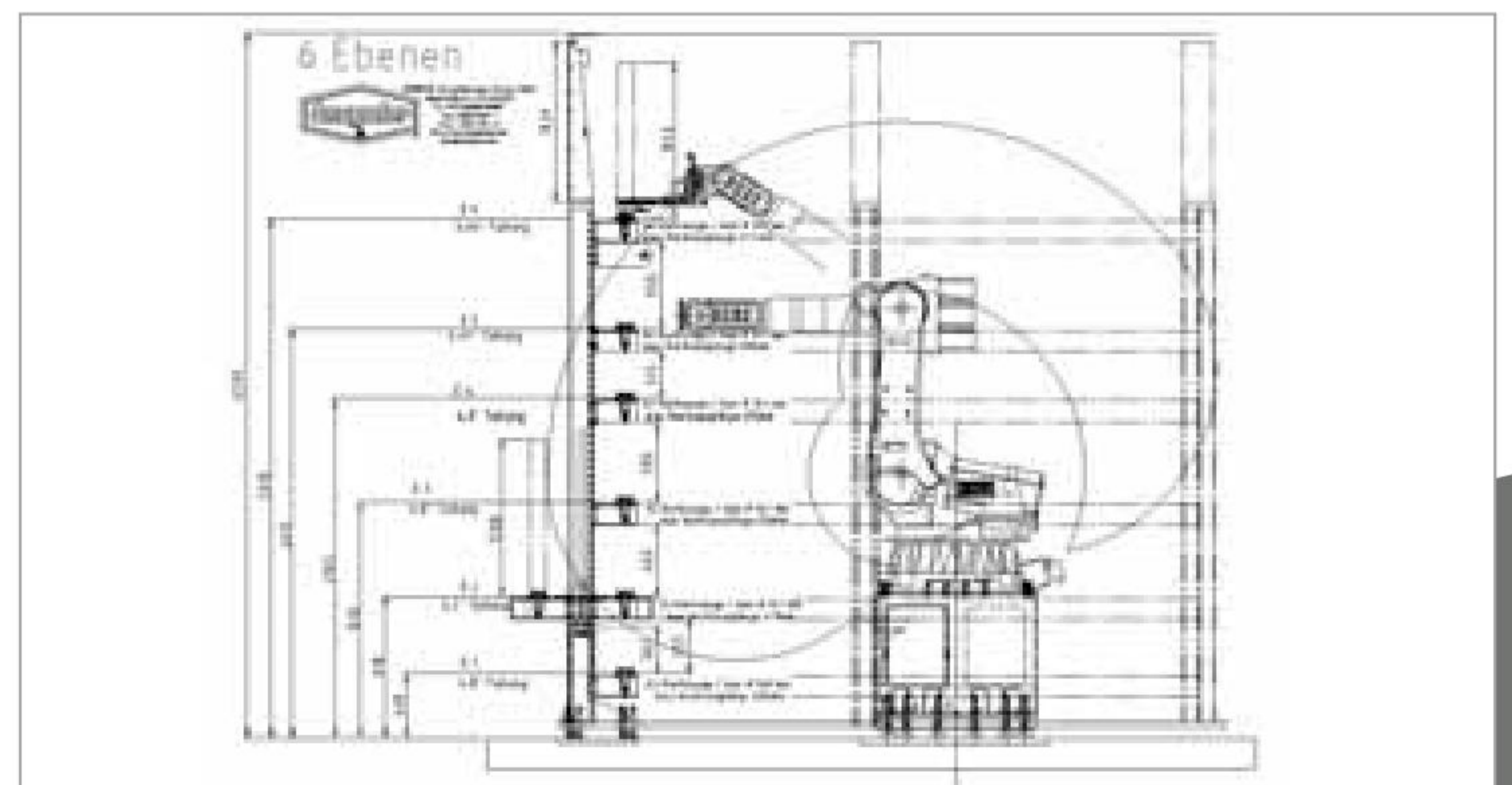


Front view

Tool arena at portal machining centre

Technical key data

- fully automated tool change with robot
- shelf with 205 tool places
- Gate with 2 x 5 storage/retrieval places incl. Balluff tool data reading system
- Tool holders SK50 flange- $\varnothing 97.5$ to 221 mm and SK 60 with flange Collar- $\varnothing 156$ and 221 mm
- Robot with load capacity of 150 kg
- Proportional gripper and integrated cleaning unit for machine taper for both holder sizes



All the way to the finished solution – one-stop service from Demmeler

Service competence – at Demmeler ...

Friendly



On account of reliable design and construction our products require only a minimum of maintenance and customer service.

Still, a Service Hotline and direct installation work at the customer premises, worldwide, is part of our range of services.

Short response times are a given for us.

Experienced and competent



Support and advice during commissioning at the customer premises

On-site repair of defective components by our service engineers (also foreign makes)

Fastness



Worldwide spare part delivery and service

Customer-oriented



Training of the assembly and service staff at the Demmeler training centre

Helpful



The Demmeler service fleet



A total of 35,000 m² operating area,
10,000 m² hall area and more than
200 highly motivated employees!

We look forward to meeting you!



Demmeler Sales, Development and Training Centre



THE ORIGINAL
Made in Germany



Demmeler offers more!

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