

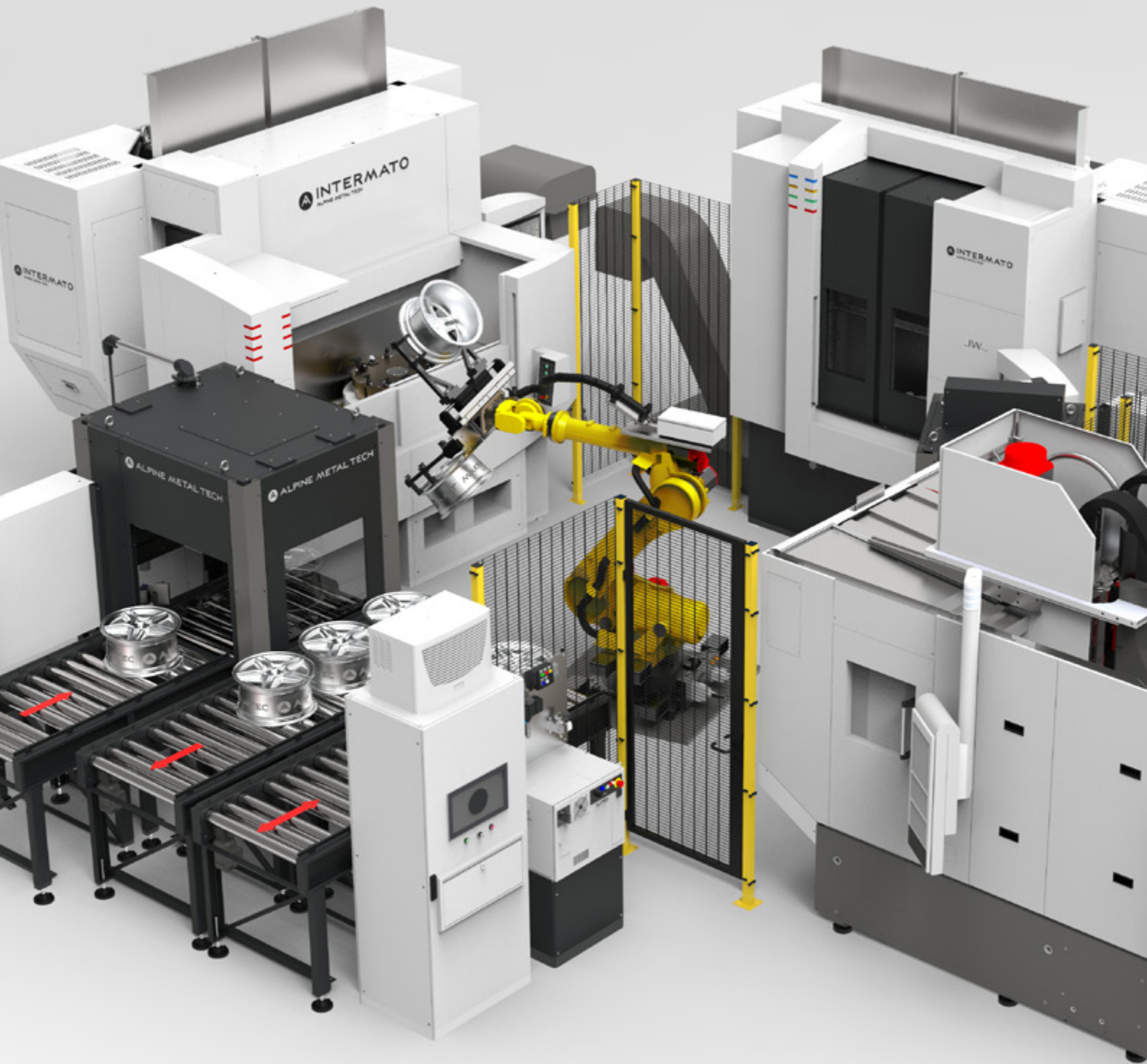


**ALPINE METAL TECH**  
A COMPANY OF MONTANA TECH COMPONENTS AG

# WHEEL MACHINING

Machining | Diamond Cut | Balance Correction





**Alpine Metal Tech robot cell automation enables a random production due to a simultaneous machining of different wheel types and sizes without a new setup.**

**Alpine Metal Tech offers a flexible robot cell automation for fully automatic random production of wheels with highest productivity and quality. This kind of robot cell automation enables a flexible configuration of a wide variety of measuring and processing machines.**

Different NUMTEC measuring machines are available for distortion, hub diameter, concentricity and axial run-out. The generated correction values are transferred to CNC machines. The INTERMATO

lathes are equipped with or without a pallet changer. INTERMATO drilling machines are available as single as well as double station machines. Machines from other manufacturers are possible to integrate. In addition to the individual configuration of measuring and CNC machines, the cell layout can be designed according to customers' requirements. This allows the integration of new cells into already existing areas and infrastructures. In addition, fully automatic production from batch size one is just as feasible as mixed production.

## YOUR ADVANTAGES

### » Random production

Fully flexible production of different wheel types and sizes is possible.

### » High performance CNC machines by Intermato

A huge variation of vertical CNC machines suitable for each individual wheel production as well as options like direct driven electro spindle or belt driven spindle, two/four axis machining, with/without pallet change table are available. Intermato CNC machines are the benchmark in respect of short cycle times and high product quality within the wheel industry.

### » Experience since 1983

The Alpine Metal Tech Group is able to develop best-fit turnkey solutions for individual customer needs, based on decades of experience.

### » Integrable measuring machines

MD321/MD322:	Distortion measurement and wheel positioning
MD422:	Center bore measurement
EXA K5:	Axial and radial runout measurement
MD220:	Measurement before diamond cut

### » Cost saving through quality improvement

Machining:	Laser-based distortion measurement of the outer clamping flange and calculation of the best wheel orientation in the CNC lathe → improved wheel quality → considerable reduction in scrap and reworking time
Diamond Cut:	Detection of distortions and irregularities in the casting and adjustment of the turning parameters → no reworking will be necessary (new coating) → increasing of the OK rate in the first turning process
Balance Correction:	Dimensional & balance inspection and precise asymmetric balancing → reduction and elimination of residual unbalance within the necessary tolerance → less wheel re-melting, reduced costs and higher production capacity

# MACHINING

## Solution 1

### » Lathes


Four axes vertical lathe with pallet  
Four axes vertical lathe without pallet

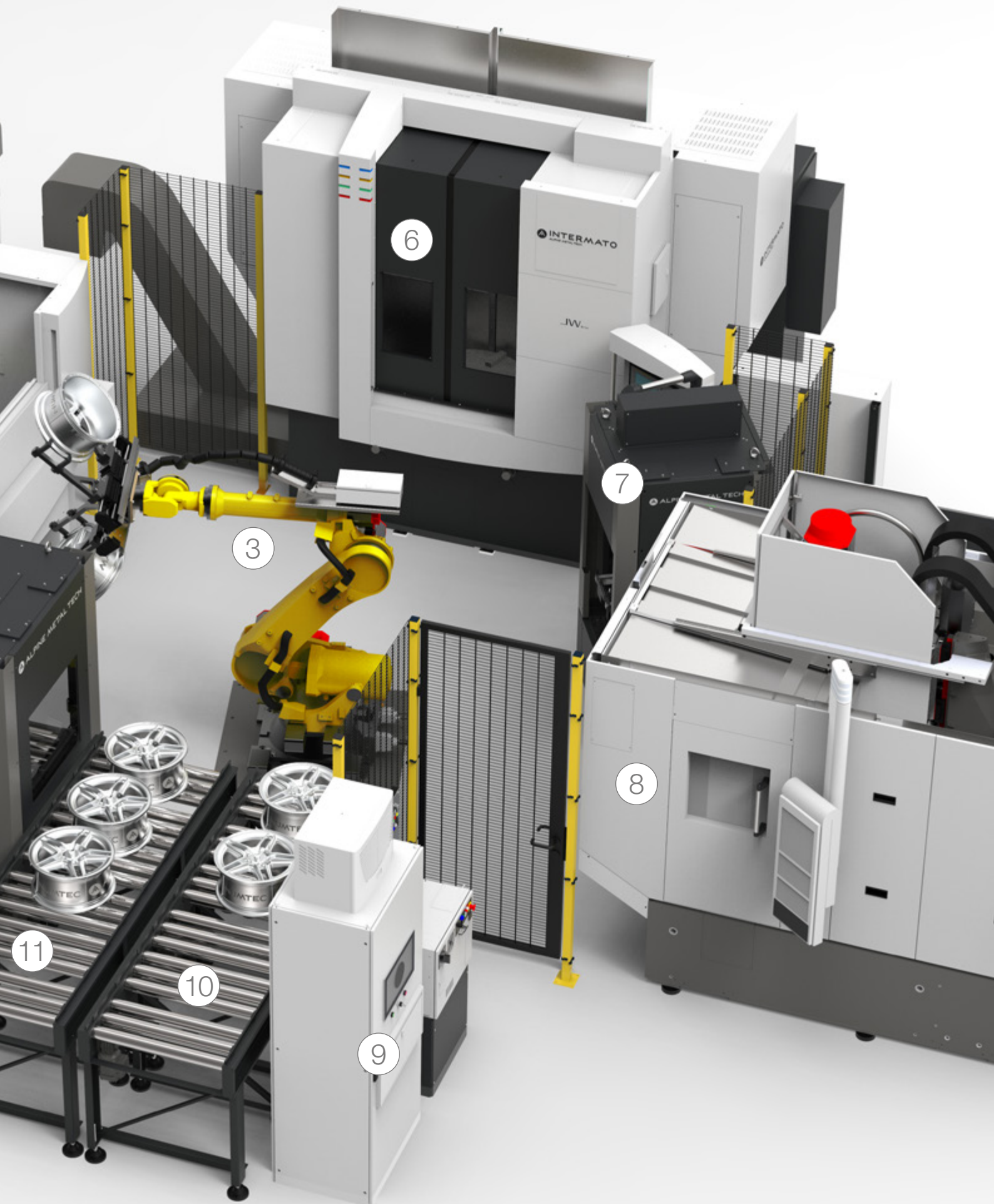
### » Measuring machines

Distortion measurement MD322  
Center bore measurement MD422  
incl. valve hole orientation  
Other machines like MD321, EXA-K5,  
CAM120, CAM220 available

### » System capacity

Max. 40 wheels/hour (8"x18" wheel)  
Cycle time analysis on specific wheels  
available on demand

- 
- ① Control of MD322
  - ② Distortion measurement MD322
  - ③ Robot with double gripper
  - ④ Lathe OP1 AW24-T4 / JW-T4
  - ⑤ Cleaning station
  - ⑥ Lathe OP2 AW24-T4sp / JW-T4sp
  - ⑦ Center bore measurement MD422
  - ⑧ Drilling machine OP3
  - ⑨ Control of cell and robot
  - ⑩ NOK wheels
  - ⑪ OK wheels



# MACHINING

## Solution 2

### » Lathes


Four axes vertical lathe with pallet  
Two axes vertical lathe without pallet

### » Measuring machines

Distortion measurement MD322  
Center bore measurement MD422  
incl. valve hole orientation  
Other machines like MD321, EXA-K5,  
CAM120, CAM220 available

### » System capacity

Max. 36 wheels/hour (8"x18" wheel)  
Cycle time analysis on specific wheels  
available on demand

- 
- ① Control of MD322
  - ② Distortion measurement MD322
  - ③ Robot
  - ④ Lathe OP1 AW24-T4 / JW-T4
  - ⑤ Cleaning station
  - ⑥ Lathe OP2 AW-T2 / JW-T2
  - ⑦ Center bore measurement MD422
  - ⑧ Drilling machine OP3
  - ⑨ Control of cell and robot
  - ⑩ NOK wheels
  - ⑪ OK wheels



# MACHINING

## Solution 3

### » Lathe

Four axes vertical lathe with pallet

### » Measuring machines

Turning device with barcode scanner

Valve hole orientation CAM120

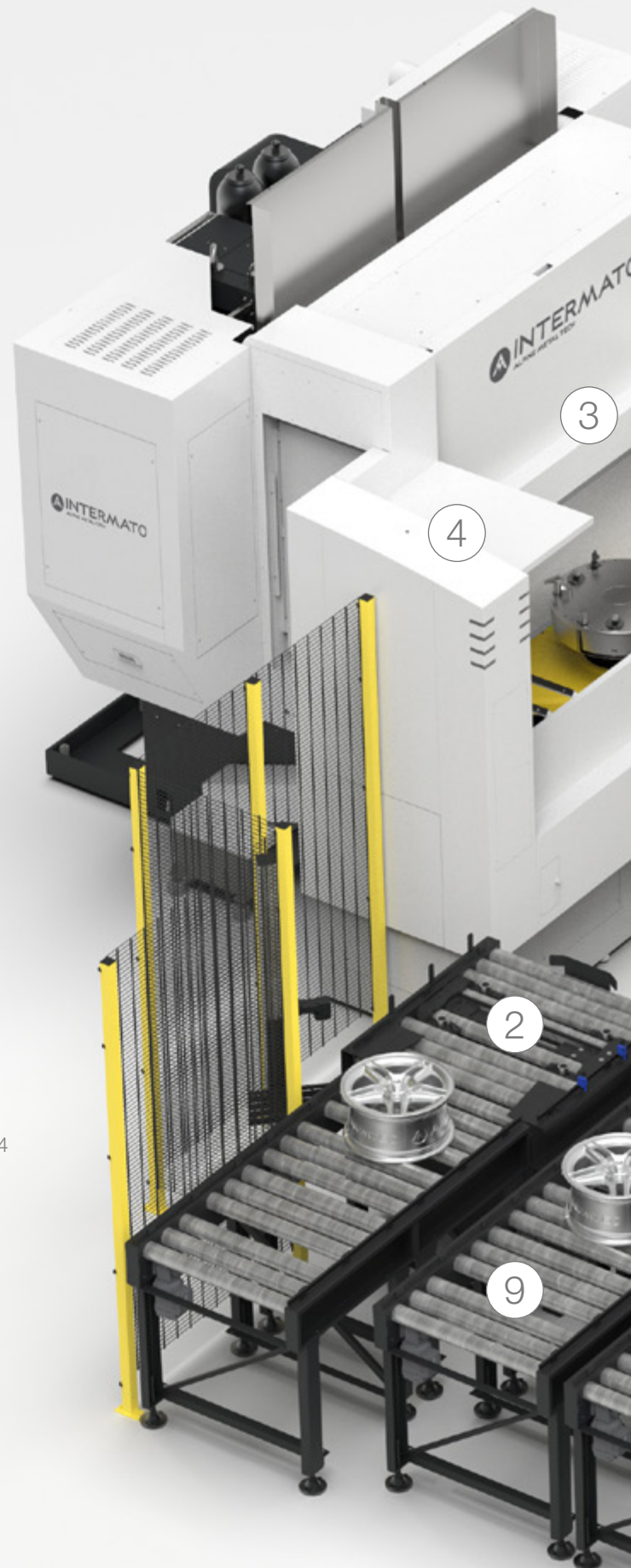
Other machines like MD321/MD322, EXA-K5, MD422, CAM220, Measuring Bench available

### » System capacity

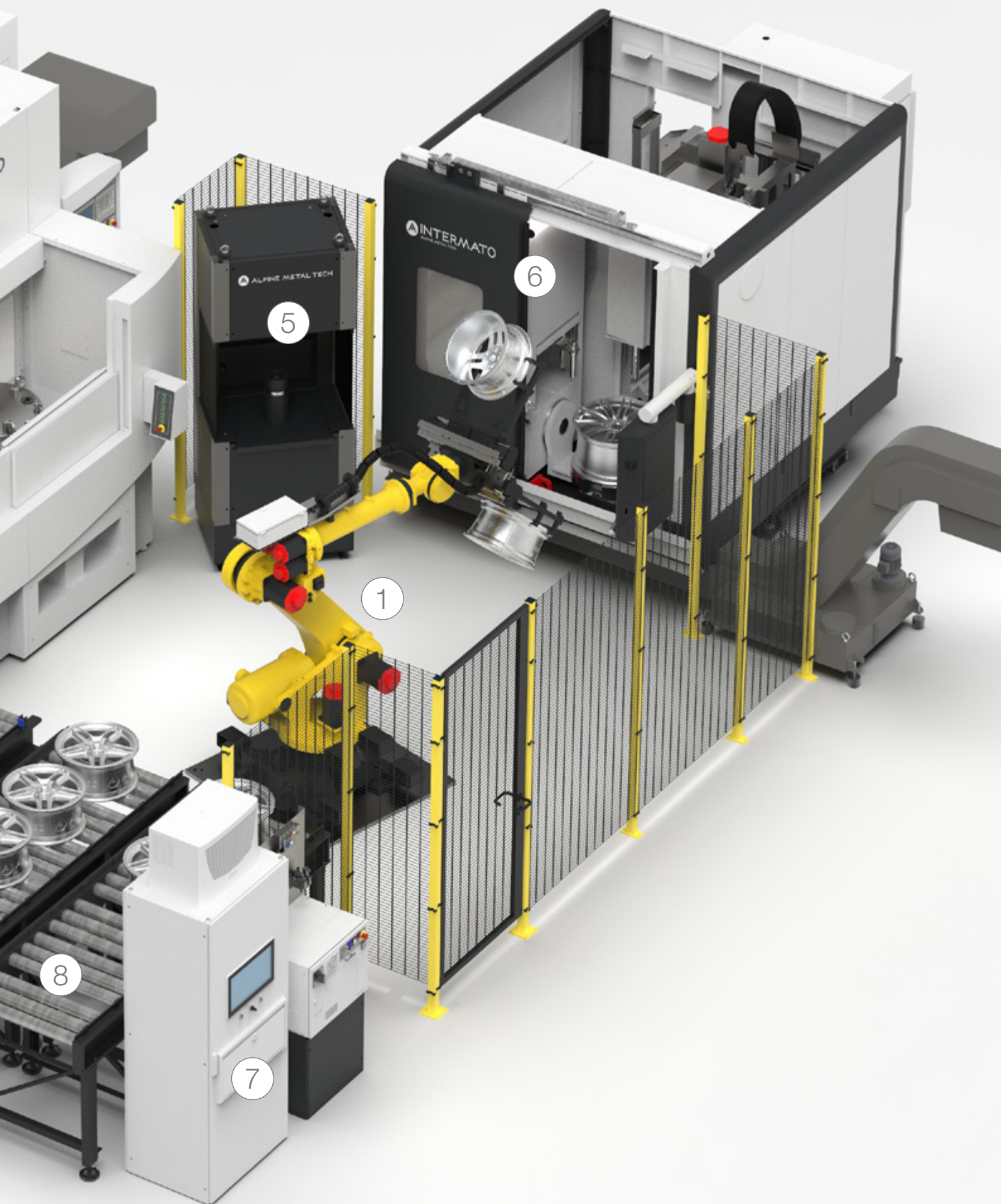
Max. 33 wheels/hour (8"x18" wheel)

Cycle time analysis on specific wheels available on demand

- ① Robot
- ② Turning device
- ③ Lathe OP1/OP2 AW24-T4 / JW-T4
- ④ Cleaning station
- ⑤ Valve hole orientation CAM120
- ⑥ Drilling machine OP3 FW-24-T
- ⑦ Control of cell and robot
- ⑧ NOK wheels
- ⑨ OK wheels





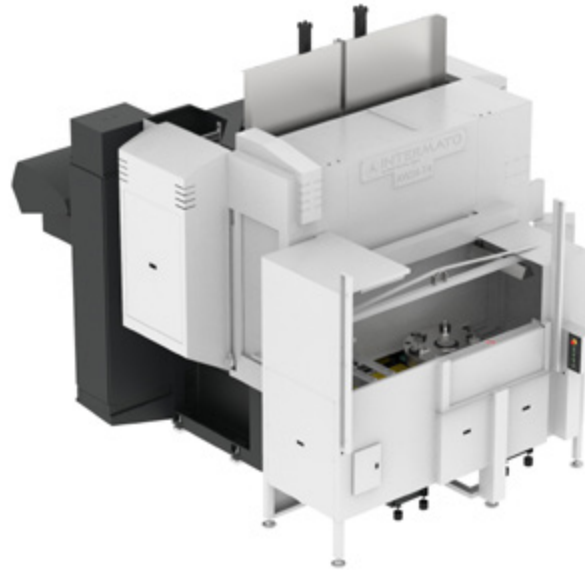


# VERTICAL LATHE

## AW series

The AW series presents high-performance vertical CNC lathes especially designed for heavy machining of aluminum wheels in fully automatic and random production lines.

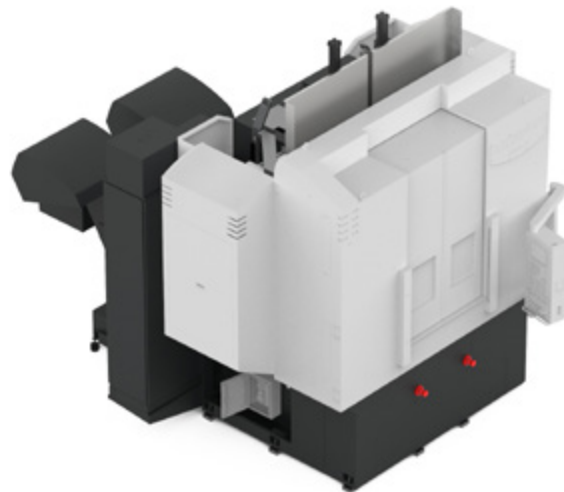
The AW series is capable to handle aluminum wheels up to 24" x 14" with perfect dimensional accuracy and surface quality. The direct-driven electro spindle offers a maximum power of 98 kW in S1, paired with an iron casted machine frame and cross slides. The AW24-T4 and AW24-T4sp are the perfect choice for heavy, fast and continuous wheel machining.



AW24-T4

### AW24-T4

The AW24-T4 is a four axes CNC vertical lathe with two turrets for simultaneous machining of aluminum wheels. This machine version is equipped with a full automated pallet change table, which significantly reduces the wheel-to-wheel cycle time. It is mainly used for first wheel machining operation at big and complex wheels, but especially with the automated pallet change table it offers the opportunity to finish both turning operations (OP1 & OP2) at the same lathe.



AW24-T4sp

### AW24-T4sp

The second machine version AW24-T4sp without pallet change table completes the AW series. It is mainly used for first and second operation and for pre-machining of special wheel designs for diamond cut. This new powerful vertical lathe generation is also the right machine for pre-machining at the flow forming process.



AW24-T2

### AW-T2

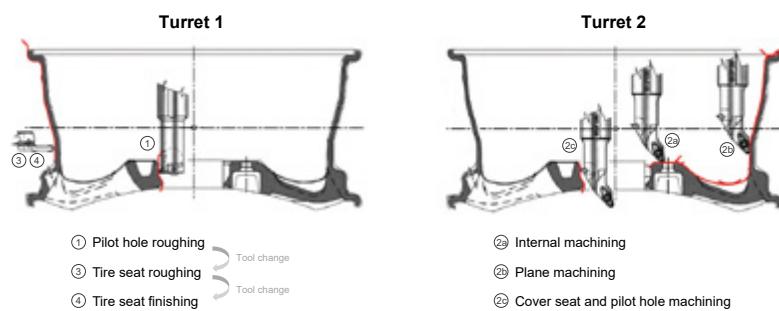
Machine version with one turret and two axes, without pallet change table; mainly used for second wheel machining operation. This version can also be used for diamond cut machining.

## Your advantages

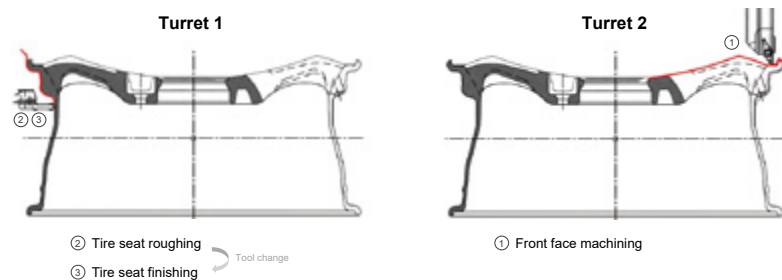
- » Short chip to chip cycle time due to direct-driven electro spindle
- » Rational design of the plant for reduction of maintenance time
- » Compact design of the machine – low space required and easy positioning in the plant
- » Low machine vibrations lead to high surface quality and dimensional accuracy
- » High production flexibility – pallet change table offers perfect set-up of individual machining line in accordance with customer production needs



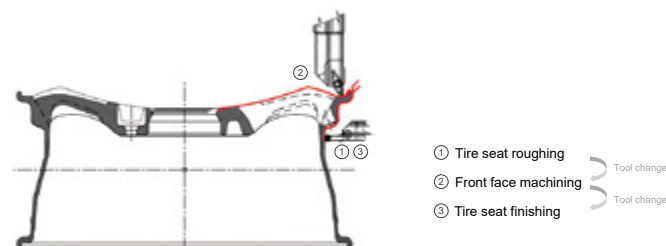
### AW24-T4 | AW24-T4sp



### AW24-T4 | AW24-T4sp

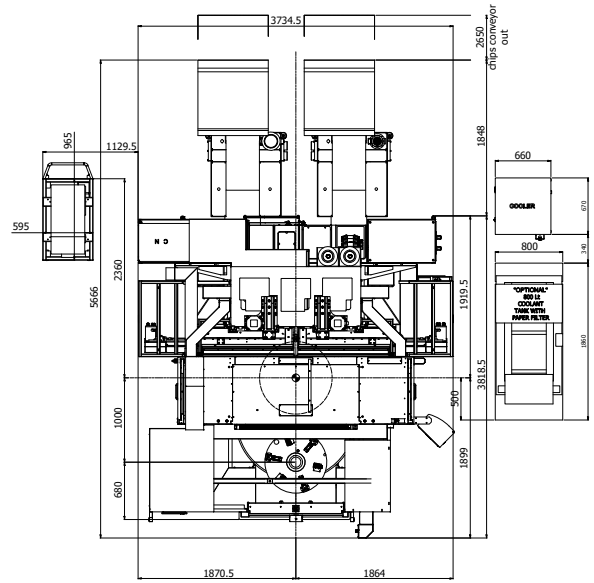
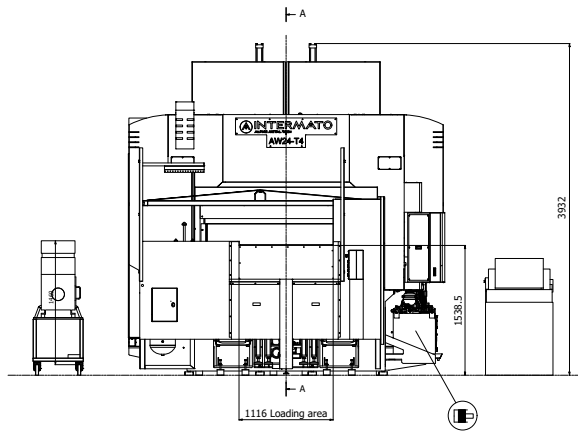


### AW24-T2

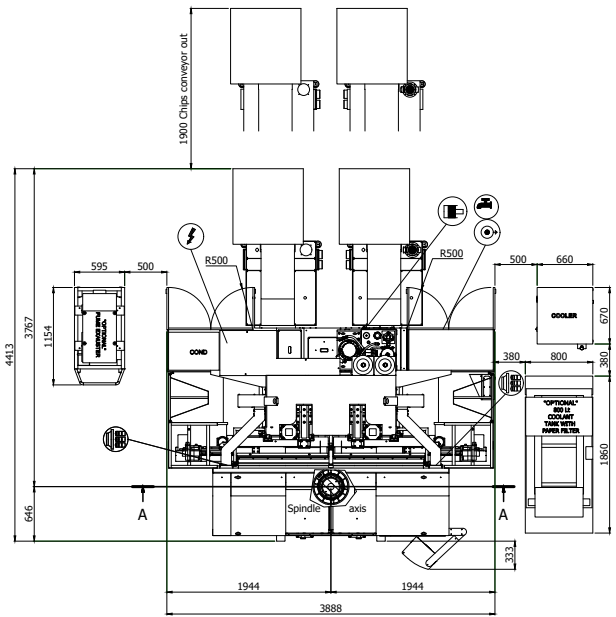
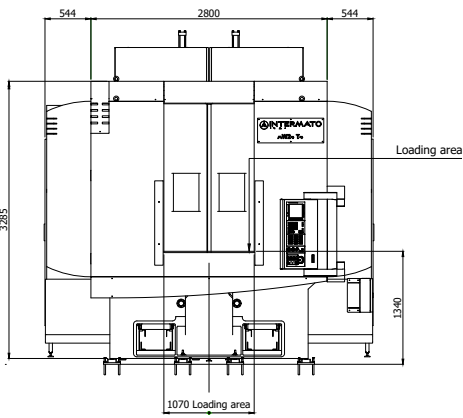


Technical data	AW24-T4	AW24-T4sp	AW24-T2
Turrets	2	2	1
Wheel size	max. 24" x 14"	max. 24" x 14"	max. 24" x 13"
Tool attachment	VDI50	VDI50	VDI50
Tool length	max. 370 mm	max. 370 mm	max. 335 mm
Slides rapid feed	max. 36 m/min	max. 36 m/min	max. 30 m/min
Spindle motor power	98 kW (S1)	98 kW (S1)	62 kW (S1)
Spindle speed	max. 3000 rpm	max. 3000 rpm	max. 3000 rpm
Spindle nose	A11 DIN 55021 - ASA 11"	A11 DIN 55021 - ASA 11"	ASA 11"
Pallet changer	included	not included	not included

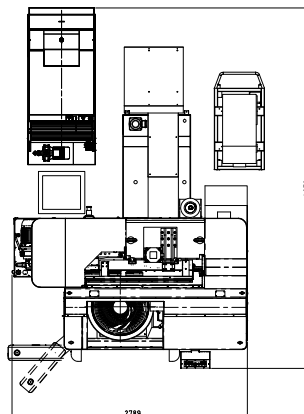
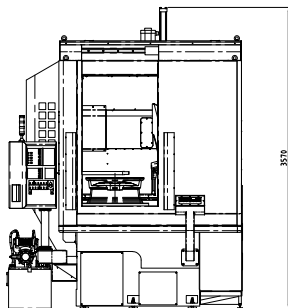
AW24-T4



AW24-T4sp



AW24-T2





# VERTICAL LATHE

## JW series

The JW series presents high-performance vertical CNC lathes from Intermato especially designed for aluminum wheel machining.

This machine series is capable to handle aluminum wheels up to 24" x 13" with perfect dimensional accuracy and surface quality. The spindle is driven by a belt with a maximum motor power of 75 kW in S3. The JW series is the ideal choice to be integrated in fully automatic and random wheel machining lines, although the single machines can also be used in manual mode. Within the JW series all common machine versions are covered to have the right machine available for each production.

### JW-T4

Machine version with two turrets and four axes, included pallet change table; mainly used for first wheel machining operation.

### JW-T4sp

Similar to JW-T4 but without pallet change table; mainly used for first and second operation to reduce cycle time for special wheel designs, e.g. pre-machining of wheel design for diamond cut.

### JW-T2

Machine version with one turret and two axes, without pallet change table; mainly used for second wheel machining operation.

## Your advantages

- » Lateral and backwards chips conveyor available for layout optimization
- » Easy maintenance
- » Compact design of the machine
- » Increase of machining quality due to optimized machine frame
- » Reduction of cycle time due to high-power spindle drive



JW-T4

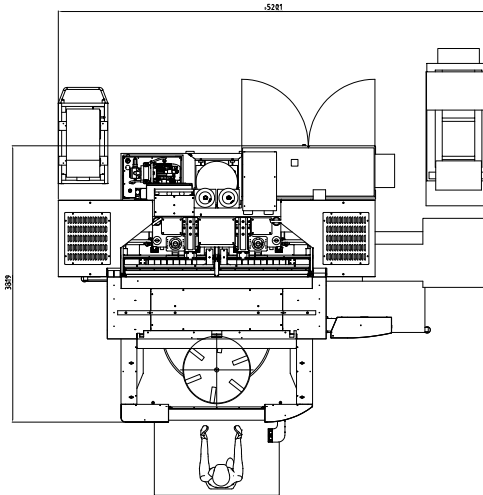
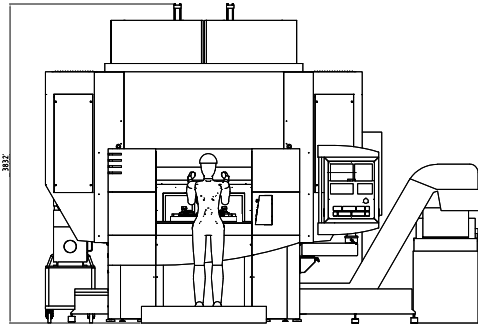


JW-T4sp

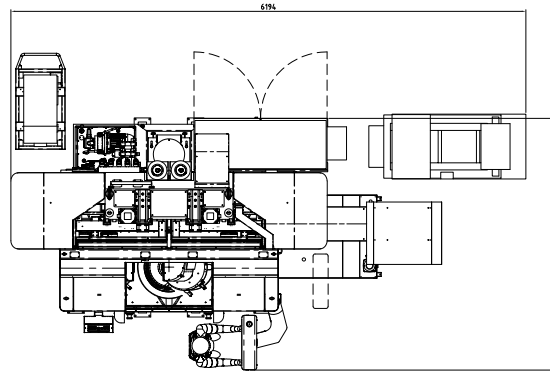
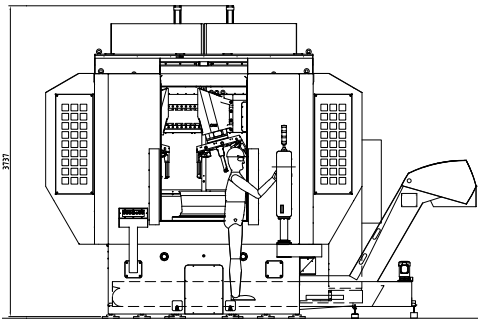


JW-T2

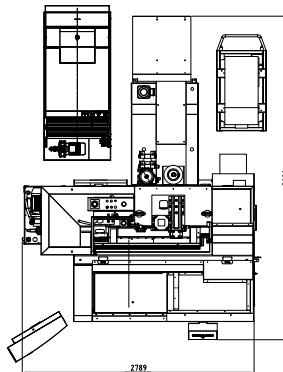
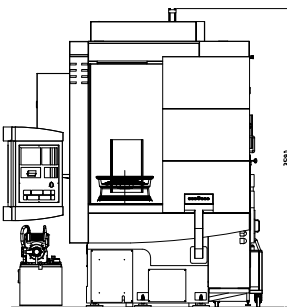
## JW-T4



## JW-T4sp



## JW-T2



Technical data	JW-T4	JW-T4sp	JW-T2
Turrets	2	2	1
Wheel size	max. 23" x 11"	max. 24" x 13"	max. 24" x 13"
Tool attachment	VDI40 / VDI50	VDI40 / VDI50	VDI40 / VDI50
Tool length	max. 330 mm	max. 335 mm	max. 335 mm
Slides rapid feed	max. 30 m/min	max. 30 m/min	max. 30 m/min
Spindle motor power	60 kW (S3), optional 75 kW	60 kW (S3), optional 75 kW	37 kW (S3), optional 45 kW
Spindle speed	max. 2500 rpm	max. 2500 rpm	max. 2500 rpm
Spindle nose	ASA 11"	ASA 11"	ASA 11"
Pallet changer	included	not included	not included

# MEASUREMENT

## MD322 Distortion measurement & wheel positioning

The MD322 machine is used for 100% process control measurement of alloy wheels before entering the CNC machining cell. It is automatically loaded from an inbound conveyor. The cell robot picks up the wheel from the MD322 machine and then continues to load the wheel for subsequent operations.

The measurement of the front face of the wheels is done with a laser scanner, mounted on a moveable X/Y-slide arrangement. The MD322 measures the deviation of the front side clamping flange and the hub area. With the integrated wheel type recognition and individual type tolerance values, the machine can either be used in batch operation or at fully random production lines without any limitations. With the MD322 at the entrance of a CNC machining cell, only wheels within tolerance will be processed. This increases the overall output of the cell. The optional measurement of the clamping flange flatness and subsequent positioning on the chuck for clamping with the least wheel distortion at OP1 improves the overall wheel quality and significantly reduces unbalance of even the most difficult wheels.



### Measurement method

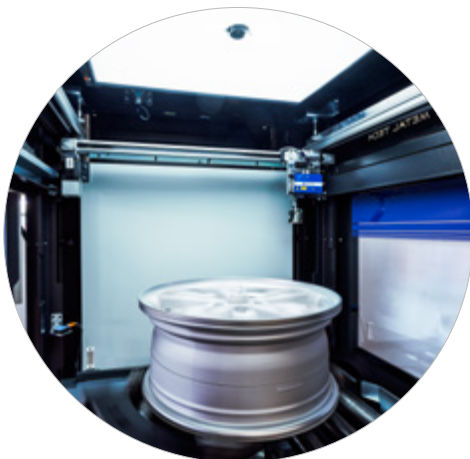
- » Laser sensor, triangulation type

### Measurement features

- » Clamping flange flatness
- » Measurement of first contact point
- » Distortion measurement hub float
- » Sprue point control
- » Barcode reading
- » Positioning for robot take-over

### Your advantages

- » Automatic distortion measurement
- » Random production is possible
- » Wheel type- and design recognition
- » Data and trend analysis for casting and heat treatment lines
- » Significant cost savings due to wheel quality improvement







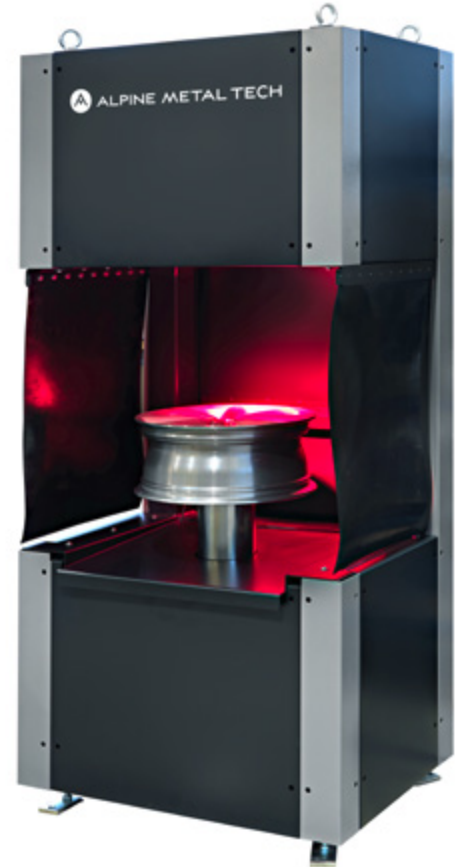
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# MEASUREMENT

## CAM120 Valve hole orientation

The CAM120 valve hole orientation system is designed to enable the drilling process (OP3) to be fully random. The system is typically located after the turning operation to get the wheel in the correct position into the CNC drill. After the robot places the wheel into the CAM120 on a universal rest pad the precise turning unit starts to rotating the wheel. During rotating a high-resolution camera with NUMTEC software is searching for the precast of the valve hole. After the precast has been found the turning unit positions the wheel in the perfect take-over position for the robot.



### Your advantages

- » Precise determination of the valve position
- » Elimination of inaccuracies through handling system
- » Operation in rough surrounding possible
- » Random production is possible

### Technical data

Turning speed	4 – 10 sec per rotation
Pos. accuracy	max. angle fault $\pm 0.4^\circ$

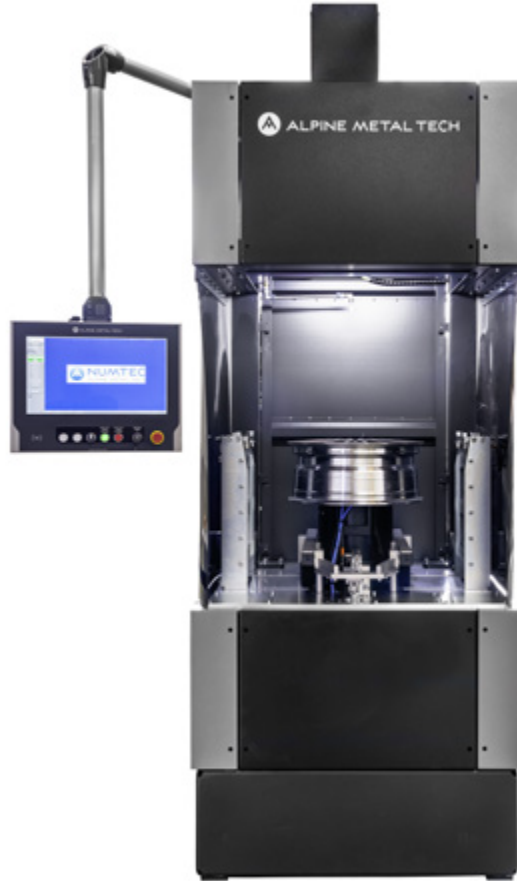


# MEASUREMENT

## MD422 Center bore measurement

The NUMTEC MD422 measures the center bore fully automatically. The system is loaded by a robot or via conveyors and the wheel will be centered and lowered into the measuring position. During the lowering, the A-value is determined, which can be used for the correction of the bolt hole depth. The center bore measurement takes place in a diameter range from 48 to 85 mm with a contactless laser sensor which has been specially developed for this application. In order to be able to correct the center bore within the tolerances, the measured values are transferred to the CNC processing machine.

With an optional positioning system, the valve hole is detected by a camera and positioned for drilling. Subsequently the wheel is lifted into the removal position and from there, it can be removed by robot or conveyed to the rejection conveyor. An automatic calibration device checks the function of the system at regular intervals. Thanks to the compact design of the machine, including an external control cabinet, it can be integrated into existing cells. Standard interfaces are available for connection to the cell control system. A dedicated Ethernet interface is used to gain access to measurement and analysis data.



### Measurement methods

- » Triangulation laser
- » Path measuring system
- » Camera (option)

### Measurement features

- » Wheel hub
- » A-value
- » Valve hole position (option)

### Measurement positions

- » Center bore  $\varnothing$ : 48 – 85 mm
- » A-value: 48 – 280 mm

### Your advantages

- » No mechanical wear due to contactless laser measurement
- » Chaotic production (center bore diameter 48 – 85 mm)
- » Automatic check of calibration
- » Fully automatic machining cell
- » Optional camera system for valve hole pos. before drilling

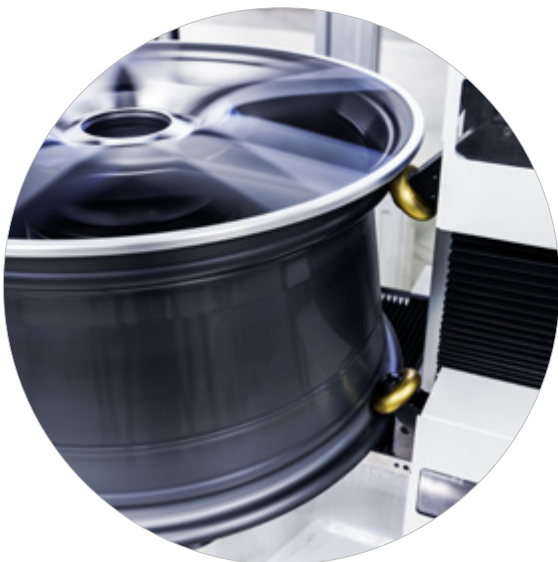


# MEASUREMENT

## EXA-K5 Axial & radial runout

The EXA-K5 measurement system is capable to measure and approve axial and radial runout on wheels within the robot line. Due to the integration directly into the production line next to the lathes every possible machining issue is displayed immediately. This guarantees the minimum waste of machining capacity and material. Additional optional functions of the EXA-K5 are the valve pre-cast orientation by implementing a camera system, a measuring system integrated at the special eight jaw clamping device to check the center bore diameter and a measurement unit to check the A-value. Of course the EXA-K5 is able to run on full mixed production. Wheels from 14" to 24" diameter and 5" to 12" height can be measured without any manual changes.

The measurement schedule starts by loading a wheel with the robot. The robot places the wheel on the eight jaw clamping device and after clamping the wheel starts rotating. As soon as the wheel arrives at measurement speed, axial and radial runout are checked and, if required, the match point can be marked by choosing different marking systems. After the measurement is done, the valve hole precast is detected and turned into takeover position for drilling. As soon as the wheel is in final position, the A-value can be measured.



### Measurement features

- » Axial & radial runout inside/outside
- » Offset
- » Rim width
- » Inner & outer tire seating circumference (calculated)
- » Calculation 1 – 6 harmonic
- » Match point angle
- » Concentricity runout displacement
- » Axial runout displacement
- » Center bore diameter
- » A-value (option)
- » Wall thickness (option)
- » Hump measurement (option)

### Your advantages

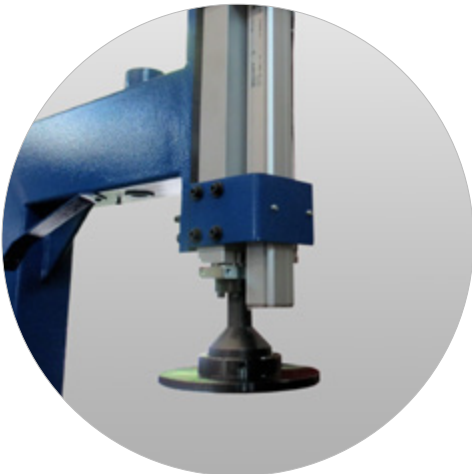
- » Accurate clamping, high-precision measurement in fully random production
- » Immediate wheel check after machining
- » Additional measurement features available – e.g. wall thickness, hump, A-value
- » User-friendly software

# MEASUREMENT

## Measuring bench

The measuring bench is the perfect solution for automated robot lines without random production. It is designed to measure all relevant and necessary wheel parameters for automatic single wheel machining lines in the most economic way. The measuring bench validates the center bore diameter and gives direct and immediate feedback to the first turning process and for quality control. Additionally, the cap seat distortion is measured to reduce the scrap rate at second turning process.

The measuring bench can be fully integrated into the robot line. As soon as the robot places the wheel on the rest position, the measuring collet checks the center bore diameter and the cup seat distortion.



### Your advantages

- » Simple design and easy maintenance
- » Ideal solution for automatic line with single wheel operation
- » High-precision measurement



### Technical data

Measurement features	center hole cup seat height
Wheel size	max. 24" x 13" no limit in center hole Ø
Measurement precision	center hole $\pm 0.005$ mm cup seat $\pm 0.05$ mm
Repeatability	center hole $\pm 0.001$ mm cup seat $\pm 0.02$ mm

# DRILLING

## FW series

The four axis drilling machine FW is specially designed to perform all necessary drilling operations on common aluminum wheels with high precision and short cycle times.

FW-24 machines are available in two different configurations, which allow covering the majority of the production requirements in the market.

The slim version FW-24-T for limited space is equipped with only one working station. The dual station version FW-24-D reduces the loading/unloading time due to the possibility that the drilling head will be moved from the first to the second station. The fourth axis is designed with a torque motor in order to grant fast, strong and precise positioning of the inclined table that improves the quality of the machined wheel.

### Typical features

- » Drilling of the bolt holes and valve hole
- » Counter boring of the bolt holes
- » Spot facing of the valve hole
- » Drilling of track holes

The tool magazine is able to handle twelve tools and can be expanded to up to thirty tools.



FW-24-T



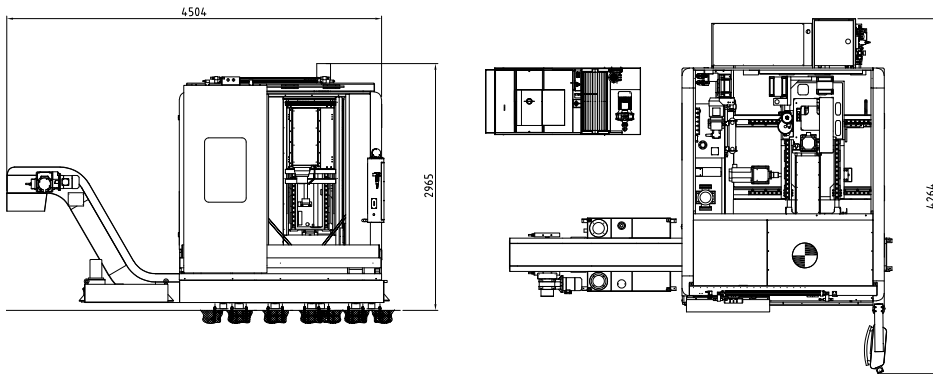
FW-24-D



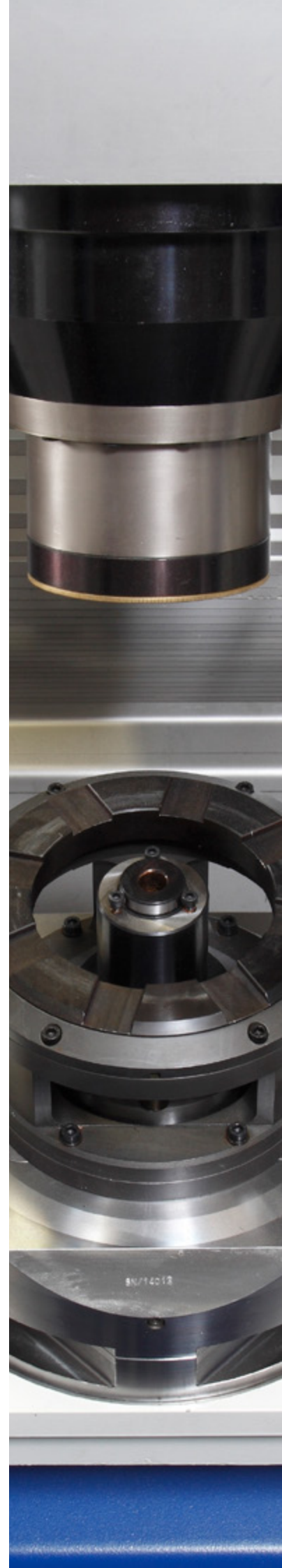
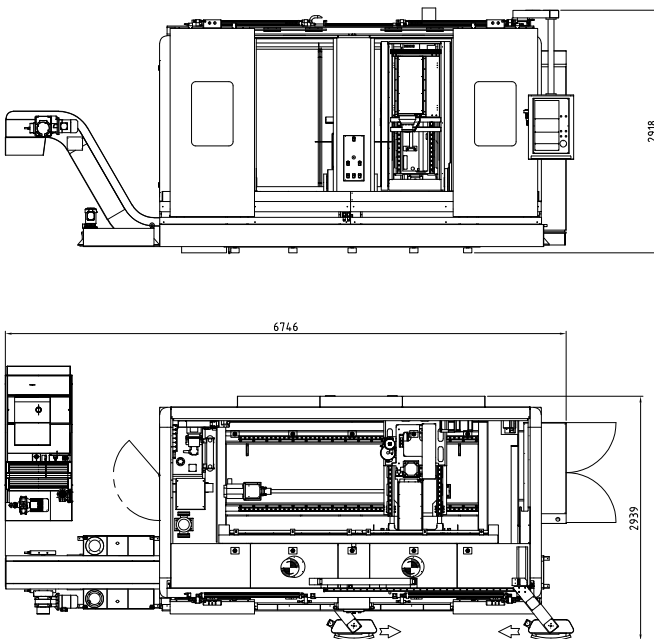
### Your advantages

- » High spindle power guarantees short cycle times
- » Torque motor at tilting table (fourth axis) for strong and precise tool positioning
- » Special machine design for aluminum wheels

## FW-24-T



## FW-24-D



### Technical data

Technical data	FW-24-T	FW-24-D
Working station	1	2
Motor	torque motor for tilting table command	torque motor for tilting table command
Wheel size	max. 24"	max. 24"
Spindle motor power	26.3 kW (S6)	26.3 kW (S6)
Spindle speed	max. 12 000 rpm	max. 12 000 rpm
Slides rapid feed	max. 50 m/min	max. 50 m/min
Tool changer	12 pos. tool changer with increased speed	12 pos. tool changer with increased speed

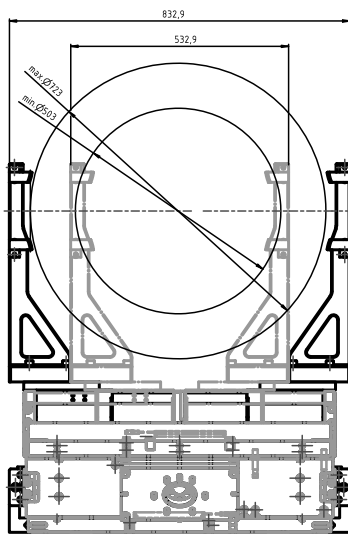
## Robot with double gripper

A standard robot is used to manipulate the wheels between the system parts. To enable short cycle times, it is equipped with a double gripper.

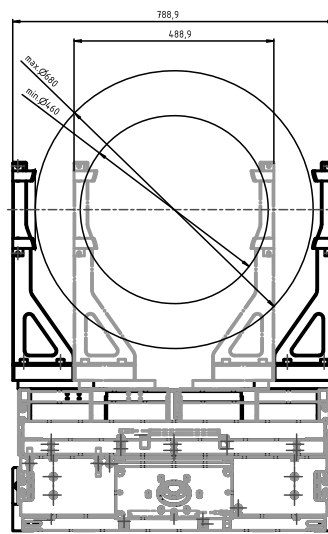
The two PHD cylinders have an automatic gripping path monitoring, which controls the position of the gripper. During each process, the exact gripping diameter is determined and compared with the preselected target diameter. In this way, problems concerning wheels with cast burrs can be identified and possible collisions prevented.

The gripper is designed in a space-saving 90° arrangement. As a result, the robot can also be used in very tight installation spaces. If necessary, the geometric arrangement can be individually adapted to the inserting position of the processing machines. The open design of the gripper body used effectively prevents problems with chips. The wheels are gripped on the front flange side in order to manipulate wheel heights from 5.5" in the system. The gripper fingers can be mounted in three positions, which means that three different size ranges can be moved with the wheel gripper (see below: mounting position 1/2/3).

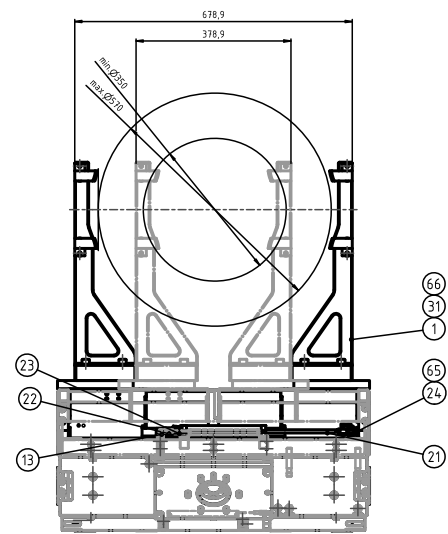
### Operating range



**Mounting position 1**  
Wheel diameter (outer flange):  
Min. 503 mm (~19") / max. 723 mm (~26")



**Mounting position 2**  
Wheel diameter (outer flange):  
Min. 460 mm (~17") / max. 680 mm (~21")



**Mounting position 3**  
Wheel diameter (outer flange):  
Min. 350 mm (~13") / max. 570 mm (~21")



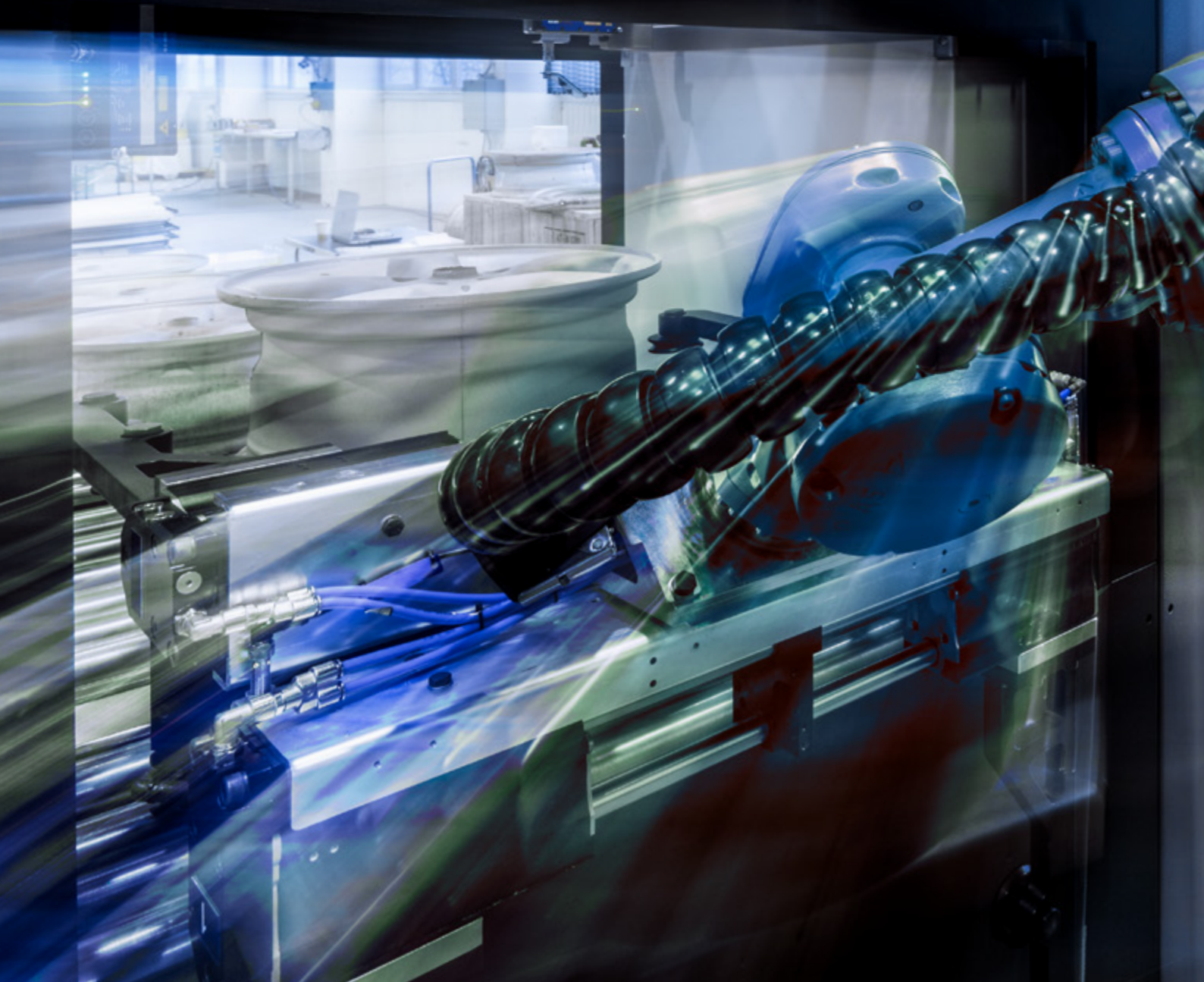
### Your advantages

- » Fully flexible production of different wheel types and sizes without manual setup changes
- » Flexible cell layout with different machine variations to meet production and space requirements of individual customers
- » Wheel type recognition with NUMTEC barcode system or by Alpine Metal Tech camera system





ALPINE METAL TECH



# WORKHOLDING

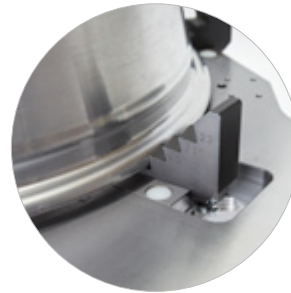
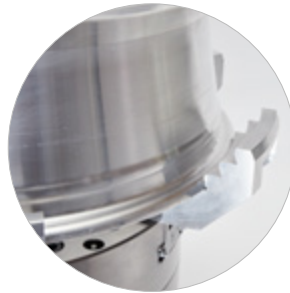


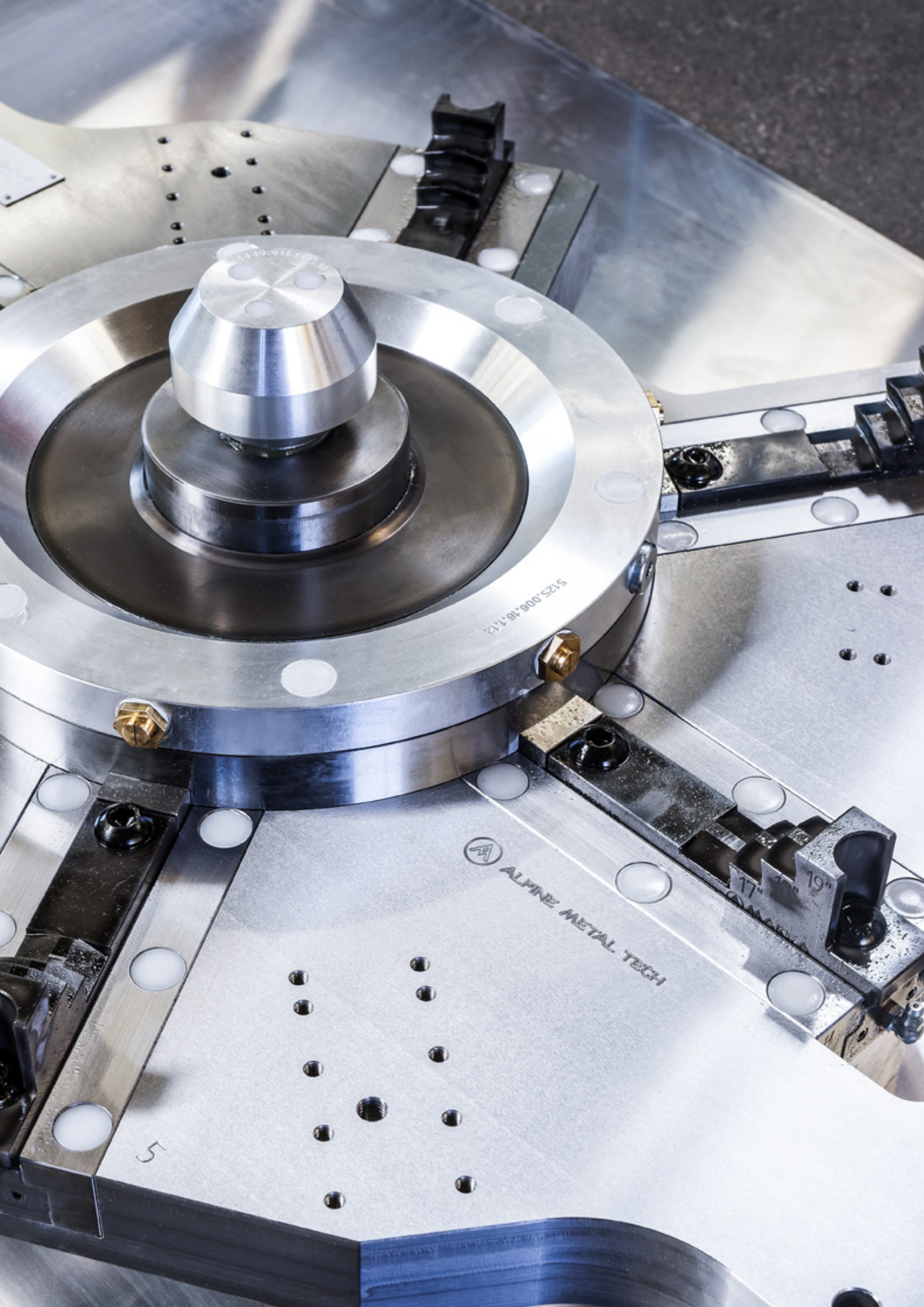
## Clamping devices

Alpine Metal Tech covers the entire clamping equipment portfolio in OP1, OP2 and OP3, from single size clamping devices to random systems. Due to in-house production of all components, we assure continuously high quality and the fastest possible respond to customer requirements and individual configurations. In addition to a robust design, key aspects of Alpine Metal Tech clamping devices are safety and ease of use. Thus, safe clamping situations, as well as high availability along with long maintenance intervals, are the main focus.

### Your advantages

- » Entire clamping equipment portfolio in OP1, OP2, OP3
- » Covering all common wheel sizes from 14 to 24 inch
- » One-stop-shop-solution
- » Modular concepts for simple retooling
- » Quick changeover, especially developed for wheel machining
- » Clamping safety for automated loading, thus good concentricity and axial runout
- » Permanently high repeat accuracy
- » Constant clamping force due to centrifugal force balancing
- » Toothed base jaws guarantee high power transmission
- » Hardened, rigid base body, thus no vibrations and irritations
- » Long maintenance intervals





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ALPINE METAL TECH

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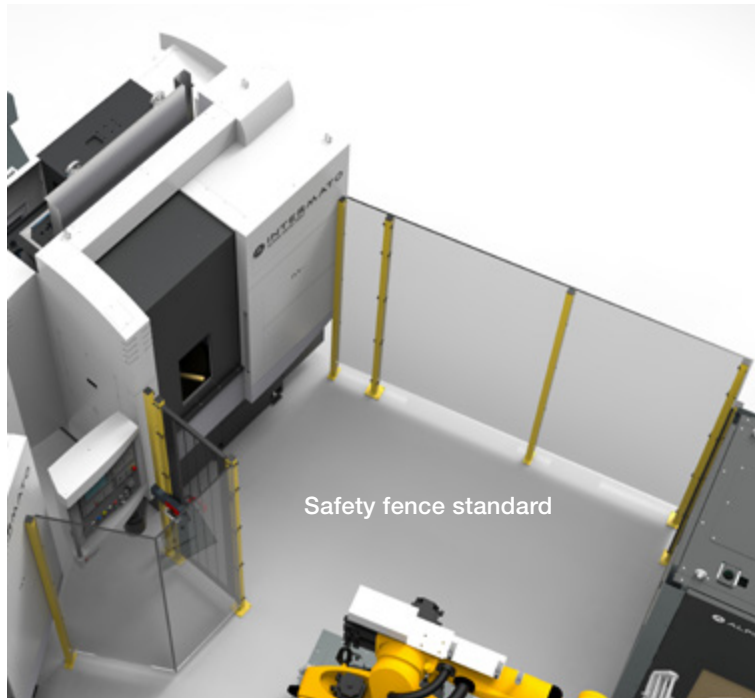
17"

19"

# SAFETY FENCE

## Standard type

There is an access door and a common protection area for the robot. During maintenance or adjustment work on one of the processing machines, the entire cell is switched off.



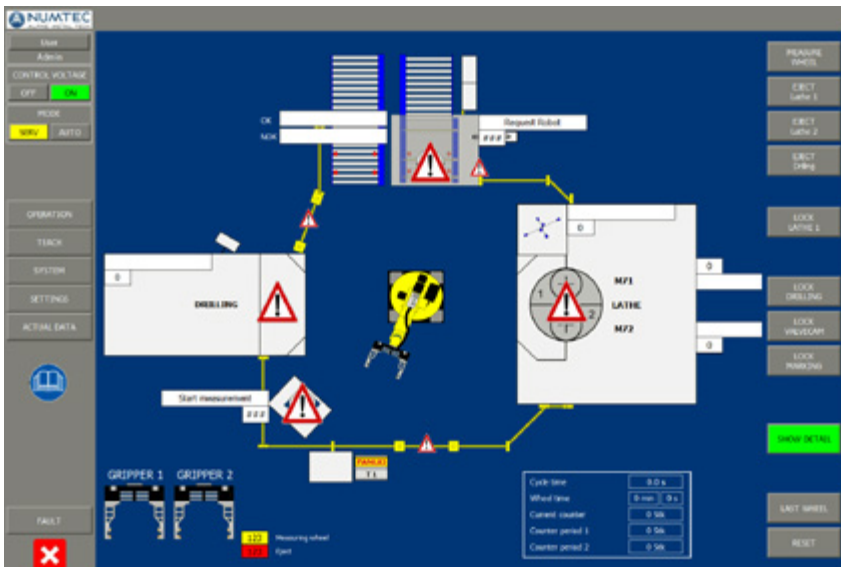
## Moveable variants

The cell is divided into different security areas. There is a door in front of each processing machine (variants: see below), which separates the lathe from the cell. This structure enables maintenance and adjustment work on a machine while the rest of the cell continues to produce automatically. In order to do so, the robot must be designed with fail-safe self-monitoring.

The movable safety guard can be designed in the following versions:

- » Swing door (manual)
- » Sliding door (manual)
- » Folding door (manual)
- » Rolling door (automatic)

# SOFTWARE



## Functions

- » Overview of machines
- » Manual operating mode
- » Wheel tracking
- » Machine status
- » Product data management
- » Machine settings
- » Interface diagnostic information
- » Error messages / buffer
- » System overview
- » Piece counter
- » Login/Logoff user administration
- » Up to 3 different chucks

# TECHNICAL DATA

Wheel parameters	wheel diameter	14" – 24"; clamping ranges: 14" – 21", 17" – 24", manual change, optional up to 26"
	wheel height	5.5" – 14"
	wheel weight	max. 45 kg
Performance	system capacity	solution 1: max. 40 wheels/h (8"x18" wheel) solution 2: max. 36 wheels/h (8"x18" wheel) solution 3: max. 33 wheels/h (8"x18" wheel)
Technical components	HMI	19" monitor
	control system	Siemens 1500 control
	wheel type recognition	NUMTEC barcode system CAM120 camera system
	wheel gripper	PHD series GRR
	flow forming wheels	special mountings available, additional axis for flow forming wheels
	wheel positioning accuracy	±0.2° (barcode reading and positioning)
Interfaces		Profibus, Profinet, OPC etc.
Media	electric supply	3 x 400 VAC ±5%, 50 Hz ±1% TN-C-S-system power consumption: approx. 15 kVA optional 3 x 460 VAC ±5%, 60 Hz ±1%
	pneumatic supply	compressed air class 3, according DIN ISO 8573-1 max. particle size 5 µm, max. particle density 5 mg/m³ residual oil content 5 mg/m³, at least 6 bar
	ambient temperature	working area 10 – 45 °C

# DIAMOND CUT

» Lathes

Two axes vertical lathe

» Measuring machines

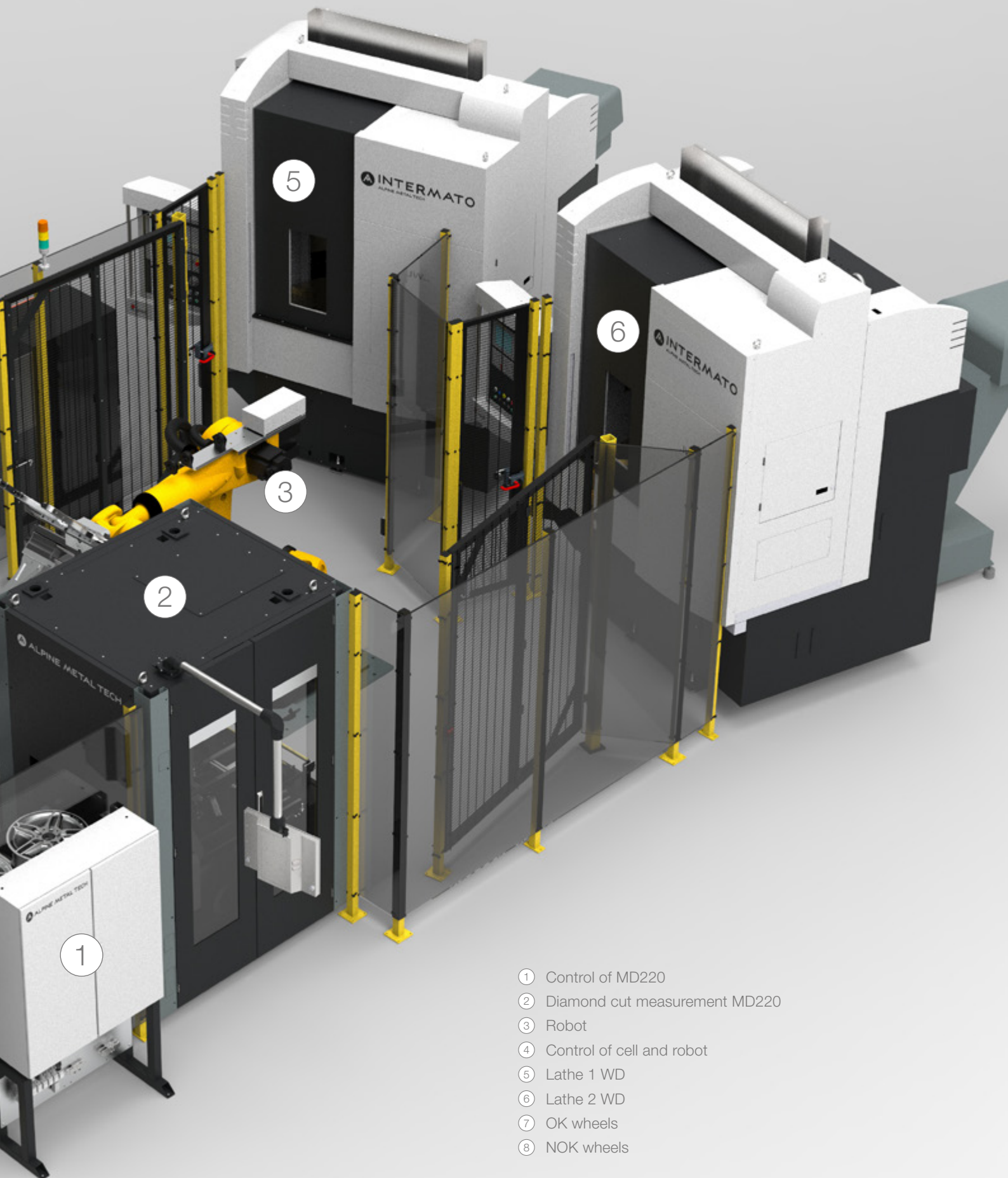
Diamond cut measurement MD220

» System capacity

Max. 60 wheels/hour (8"x18" wheel)

Cycle time analysis on specific wheels  
available on demand





- ① Control of MD220
- ② Diamond cut measurement MD220
- ③ Robot
- ④ Control of cell and robot
- ⑤ Lathe 1 WD
- ⑥ Lathe 2 WD
- ⑦ OK wheels
- ⑧ NOK wheels

# MEASUREMENT

## MD220

The MD220 measuring machine is used for precise measurement of the visual side of wheels prior to the diamond cut process. It can be integrated in fully automated machining lines and is capable of random production.

Using an integrated conveyor and an optional camera system, the wheel is positioned, aligned and placed on the resting pad jaws which are designed to simulate the resting situation at the lathe. The measurement with the NUMTEC precision laser is done preferably at the front or outside flange and in the vicinity of the cap seat. The deepest points are determined from these two measuring circuits and a deviation from a sample wheel is calculated on this basis. The correction data of each individual wheel is passed along to the lathe by using a standardized interface. This guarantees high production output paired with low scrap rate. Optionally, a paint layer thickness measurement is available.



### Measurement methods

- » Laser sensor, triangulation type
- » Camera (option)
- » Infrared sensor (option)
- » Photo-thermal measurement

### Measurement features

- » Wheel distortion (design side)
- » Paint thickness (option)
- » Valve hole alignment (option)
- » Cap jump / cap diameter monitoring

### Your advantages

- » Correction values for the subsequent turning process to minimize the scrap rate
- » Use of special laser sensor, different paint colors can be measured
- » Flexibility (14" – 24" wheels can be measured without retooling)
- » Contact-free paint layer thickness measurement (optional)





# VERTICAL LATHE

## WD

The WD high-performance vertical lathe presents the perfect solution for diamond operation of aluminum wheels after the painting process.

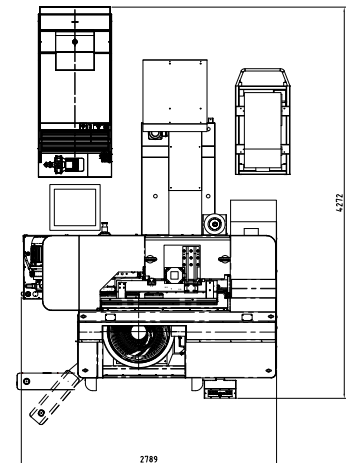
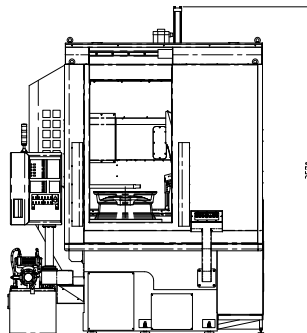
This machine is specially designed for front face machining, also called diamond cutting, to receive a high-quality surface finishing. The machining process differs substantially from the already well-known diamond finishing machine. In fact, the quality of the obtained finished surface achieves a rainbow effect very close to the chrome plating process.

The WD machine, as well as all other Intermato machines, can be equipped with an automatic loading/unloading system and can be supplied as a “turnkey”.



### Technical data

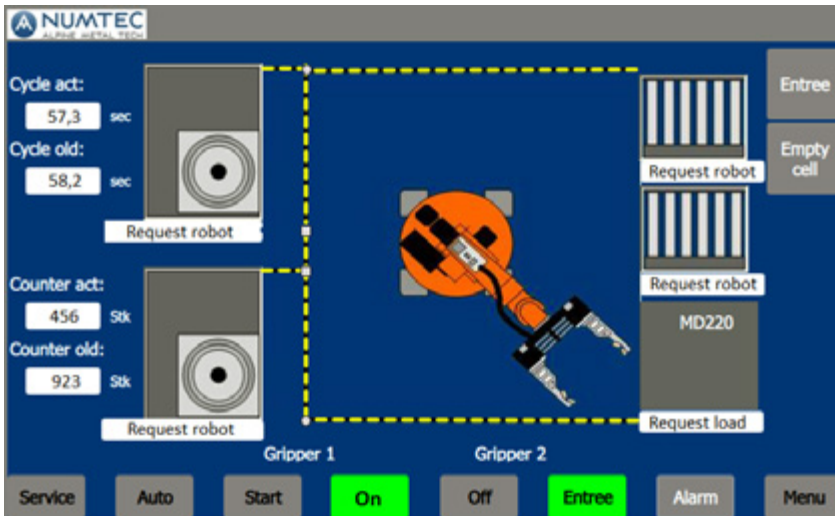
Turrets	1
Wheel size	max. 24" x 13"
Tool attachment	VDI50
Tool length	max. 330 mm
Slides rapid feed	max. 30 m/min
Spindle motor power	62 kW (S1)
Spindle speed	max. 3000 rpm
Spindle nose	ASA 11"



### Your advantages

- » Higher surface quality due to precise roller guides
- » Removed toothed belt eliminates vibration on the machine
- » Machining profile can be tilted and shifted
- » Reduced risk of damaging the painting on the spoke's edges

# SOFTWARE



## Functions

- » Overview of machines
- » Error messages
- » Active lists
- » Product data management
- » Machine settings
- » Wheel tracking
- » Machine status
- » Error messages / buffer
- » Piece counter
- » Login/Logoff administration
- » Interface diagnostic information

## TECHNICAL DATA

Wheel parameters	wheel diameter	14" – 24" clamping ranges: 14" – 21", 17" – 24", manual change
	wheel height	5.5" – 14"
	wheel weight	max. 35 kg
Performance	system capacity	max. 60 wheels/h (8"x18" wheel)
Technical components	HMI	7" TFT display
	control system	Siemens 1500 control
	wheel type recognition	camera system / type information via interface
	wheel gripper	PHD series GRR
	support jaws	3 or 6 pcs.
	support flange	in the MD220
	wheel positioning accuracy	±0.2° (positioning)
Interfaces		Profibus, Profinet, OPC etc.
Media	electric supply	3 x 400 VAC ±5%, 50 Hz ±1% TN-C-S-system power consumption: approx. 10 kVA optional 3 x 460 VAC ±5%, 60 Hz ±1%
	pneumatic supply	compressed air class 3, according DIN ISO 8573-1 max. particle size 5 µm, max. particle density 5 mg/m³ residual oil content 5 mg/m³, at least 6 bar
	ambient temperature	working area 10 – 45 °C



- ① Robot
- ② Control of cell and robot
- ③ Lathe 1 WB24
- ④ Lathe 2 WB24
- ⑤ OK wheels
- ⑥ NOK wheels

# BALANCE CORRECTION

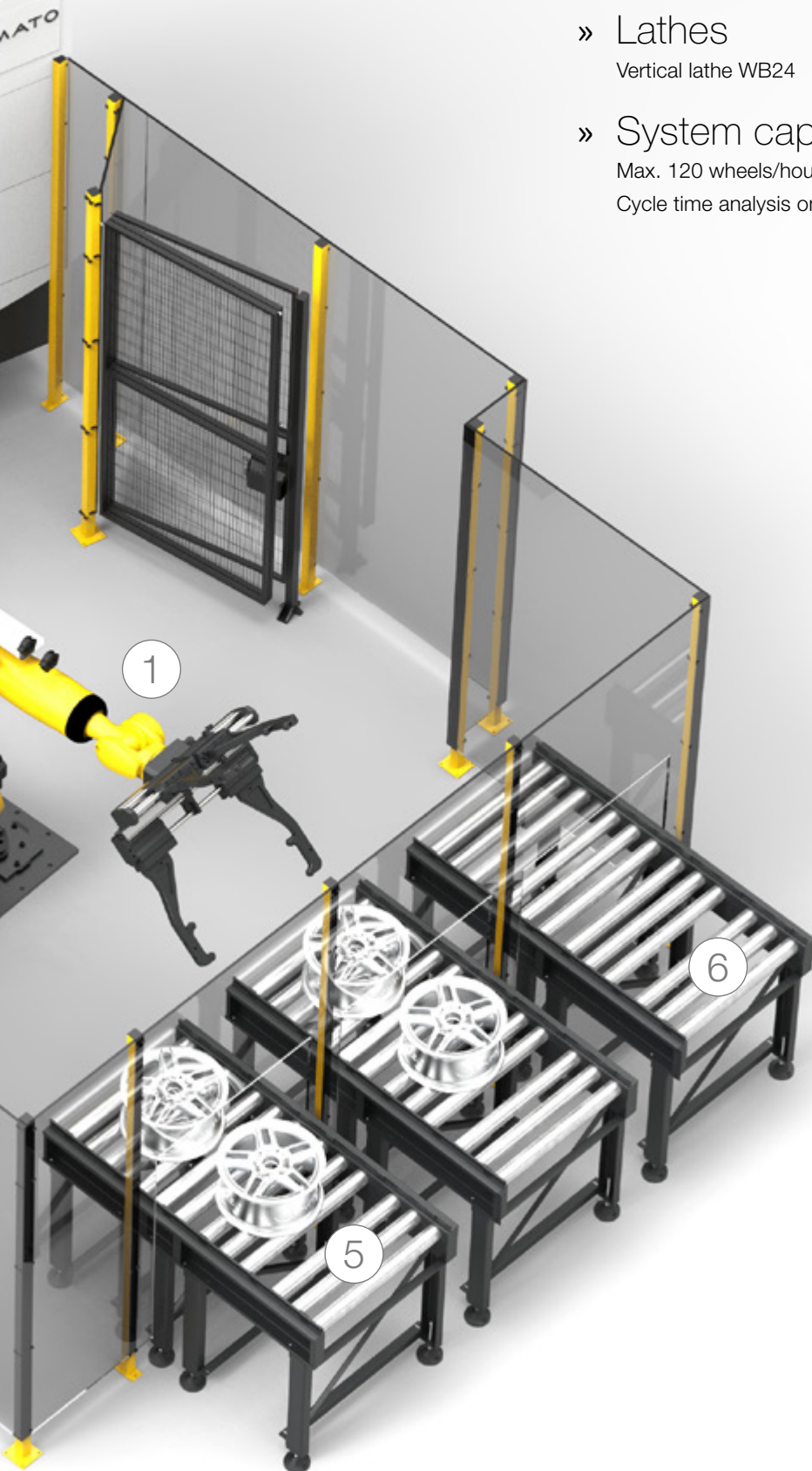
» Lathes

Vertical lathe WB24

» System capacity

Max. 120 wheels/hour (8"x18" wheel)

Cycle time analysis on specific wheels available on demand

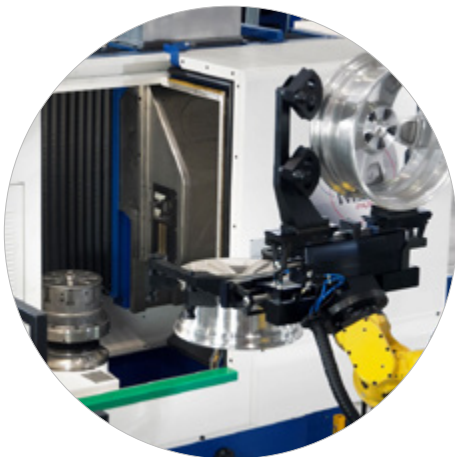


# VERTICAL LATHE

## WB24

The WB24 vertical lathe results from the increasingly stringent tolerance reduction of vehicle manufacturers.

The patented Intermato CNC lathe WB24 is developed for balancing wheels which are out of tolerance after the machining process. The WB24 is configured as a two axis vertical lathe with an auxiliary U axis synchronized with the turning spindle in order to perform "asymmetric" profiles. Proven asymmetric turning capability and static/dynamic balancing systems are utilized, creating high-speed detection systems. After loading the workpiece, dimensional and balance inspection, the asymmetric turning reduces and eliminates residual unbalance within the necessary tolerance.



### Your advantages

- » Reduced costs due to wheel repairing
- » Higher production capacity due to less wheel re-melting

### Technical data

Wheel size	max. 24"
Max. diameter	800 mm
X-axis stroke	500 mm
Z-axis stroke	500 mm
Asymmetric machining U-axis stroke	30 mm
Spindle motor power	22.5 kW (S3)
Spindle speed	max. 2500 rpm
Weight	6400 kg

## Unique combination of technology

Precise balancing and turning know-how has been merged to one unique machine called WB24. The combination of both technologies allows the optimization of wheels with balance issues after the machining process.

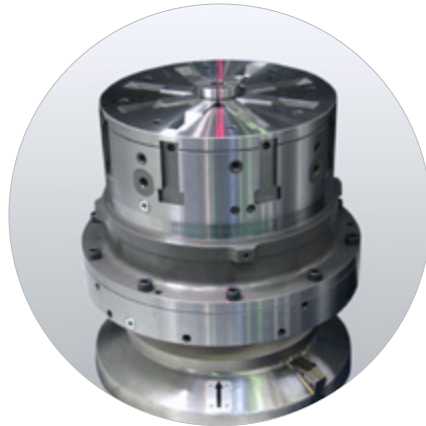
The following patents have been granted to this development:

- » European patent no.: 1687153
- » Chinese patent no.: 200480035296
- » US patent no.: 7963028



## Clamping device

Universal, pneumatic clamping equipment for wheels up to 24" diameter are available. Centering and clamping of the wheel inside the center bore is carried out by 8 jaws. It is designed for center bore diameters from 53 to 100 mm or optional from 99 to 146 mm. This flexible clamping device can be used for chaotic production.



## Dimensional wheel check

For dimensional wheel checks, a touch probe is available. It is mounted directly on the machining head to guarantee precise measurements before and after the reworking process of the wheel.

The touch probe unit consists of:

- » Individual slide with horizontal movement
- » Automatic safety guard
- » Touch probe



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