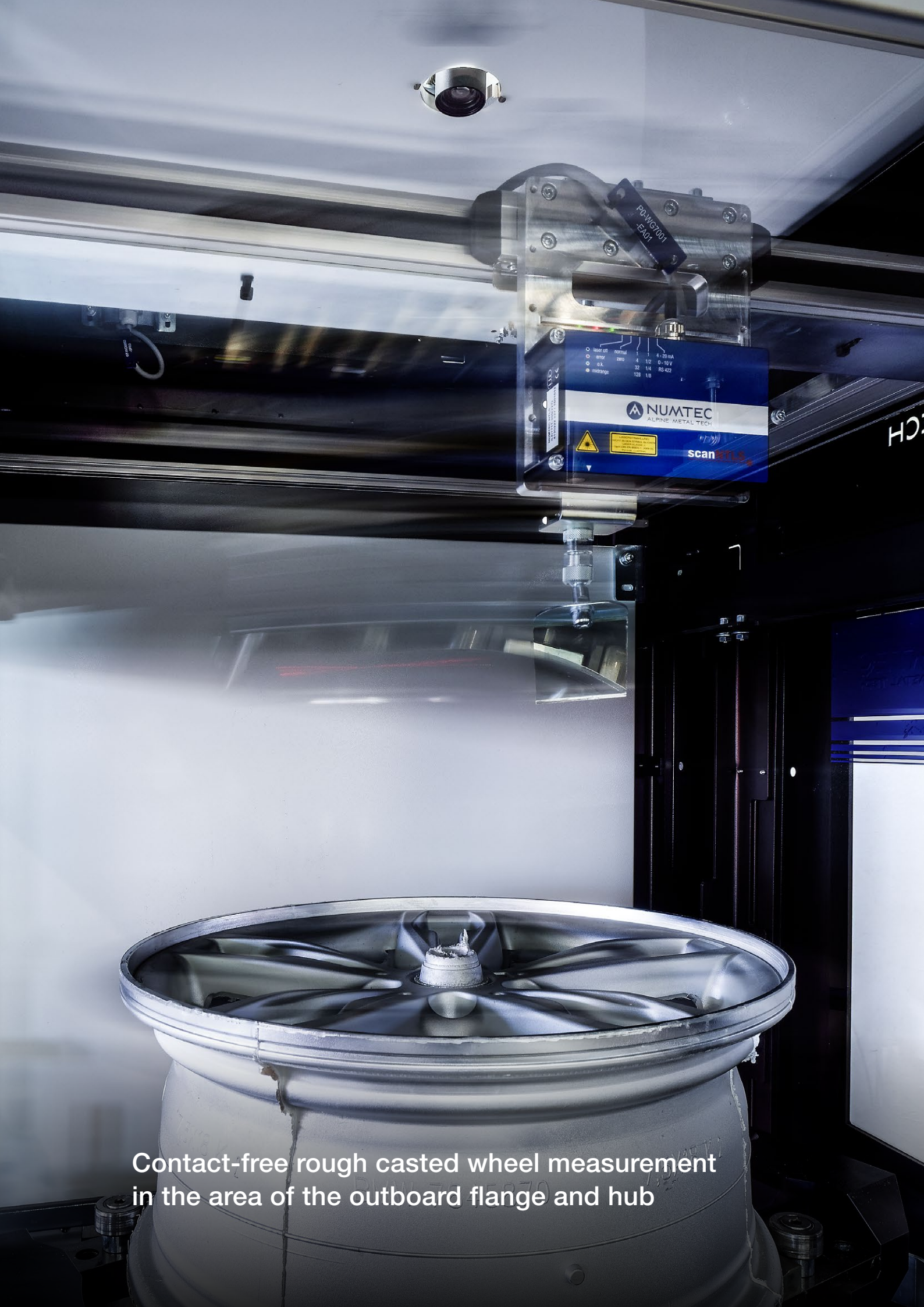


# MD140

Inline distortion measurement







Contact-free rough casted wheel measurement  
in the area of the outboard flange and hub

# MD140

## Inline distortion measurement

**The MD140 distortion measuring machine is used for the 100% checking of aluminum wheels directly after the casting process or, alternatively, after heat treatment.**

The design as inline version eliminates the need for an additional loading and unloading process. Thus an effective and space-saving installation is made possible. Using a mobile laser sensor, the areas on the outside of the visible outboard flange (chucking area for OP1) and inside the hub area are measured and tested. With the integrated wheel detection and the option to set type-based limit values, optimal testing

can be ensured even for chaotic feed. With the use of the MD140, only those wheels are transported to the machining lines that are within the preset limit values. The generated measurement data can be used for purposes of analysis and for making optimizations possible in the casting process. With the NUMTEC barcode, every measurement can be traced back to one mold and thus to a single casting system. In order to ensure identical test data in the case of multiple systems, the machines are networked with one another and the test data is compared

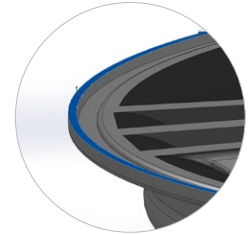
## YOUR ADVANTAGES

- » Distortion measurement  
Fully automatic laser measurement on the outboard flange and in the hub area; additional sprue check possible, depending on the installation location
- » Chaotic production  
Possible due to wheel-specific measurement programs; no need to retool the system
- » Trend analysis  
Trend analyses of the casting and heat treatment process can be displayed by means of the data for production monitoring that is stored in the system.
- » Cost savings and capacity boost  
Because NOK wheels are rejected at an early stage, no superfluous work steps are carried out on NOK wheels – capacities on downstream units are freed up.
- » NUMTEC barcode/camera system  
Type detection with the NUMTEC barcode system or optional camera design detection

# FUNCTION

## Measuring process

- » Feed into the integrated turning unit
- » Type detection with barcode or camera system
- » Further transport into the measuring position
- » Determination of position and distortion measurement with laser
- » Outfeed of the wheels, OK/NOK message to conveyor

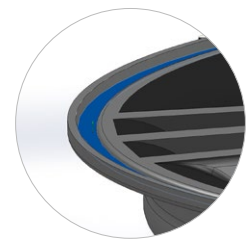


Possible measuring position 1:  
Top edge of outboard flange

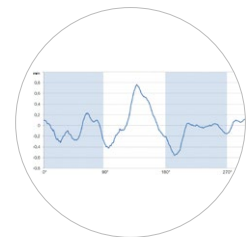
## Flatness measurement (outboard flange)

After the type detection and measuring the position of the wheel, the laser sensor measures the flatness of the entire outboard flange. The laser sensor moves the complete 360° along the outboard flange and records a height value every 0.1°. The exact shape or deformation of the chucking area is then calculated from these 3600 distance values. Since this variance, or flatness error, later has an enormous influence on the quality of the wheels in terms of imbalance and design impact, a maximum admissible production tolerance in the casting area can be inferred from it. If the tolerance is exceeded, wheels are immediately rejected, and corrective measures can be initiated in the foundry or heat treatment.

- » Early detection of faulty wheels and a quick initiation of corrective measures in the foundry or heat treatment area.
- » Avoidance of unnecessary and costly work steps on wheels that are already outside the admissible tolerance.
- » Capacity increase of the existing production line due to early rejection of NOK wheels.



Possible measuring position 2:  
Resting pad surface of  
chucking area



Flatness of outboard flange

## Distortion measurement in the cap area

As a second measurement, the cap area of the wheels is measured. The height level in the cap area is compared with the level of the visible outboard flange, and the variance from the nominal size is determined. This variance can be used to carry out the following steps:

- » direct checking of the variance in relation to each wheel type and derivation of direct OK/NOK criteria for each wheel. With this, unnecessary and costly work steps on wheels that are already outside the admissible tolerance are avoided.
- » Direct derivation of the quality of the casting process. The wheels are measured immediately after the casting process, so all casting machines can be monitored in real time. Errors or the reaching of intervention limits can be immediately used to initiate corrective measures so scrap is avoided before it even comes into being.



Distortion measurement in the  
cap area



Trend analysis /  
production monitoring



# FEATURES

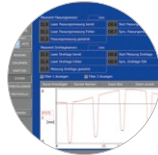
## Intuitive, networkable software

Intuitive programming of new wheel types; software available in multiple languages; networking of several systems in order to compare test data.



## Analysis software

Optional analysis software for the analysis of the measurement data and improvement of the casting process.



## Wheel type identification

The wheel with the NUMTEC barcode is moved past the scanner by the integrated turning unit; here the coding is read during the movement.



## NUMTEC laser unit

Maximum measurement quality through the use of optimized NUMTEC laser sensors.



## Variable frame concept

Thanks to a special frame concept, easy adaption of the frame heights.



## Sprue check

Depending on the installation position, possibility of 100% check of the sprue drilling.



## Roundness measurement

Optional accessory for roundness measurement at the rear flange on the inside of the wheel.



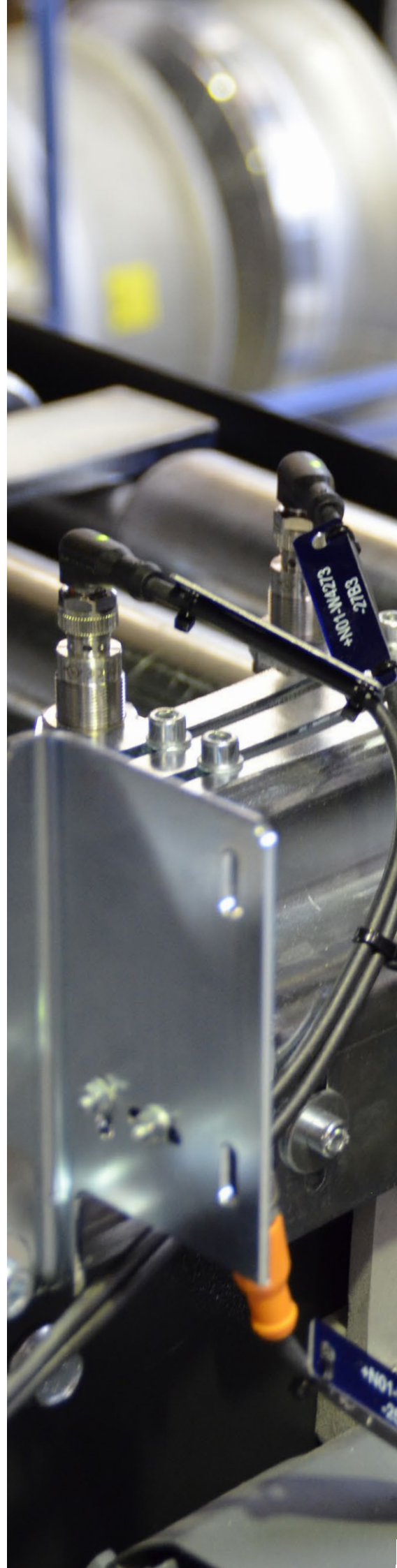
## Camera system

Optional camera system for fully automatic type detection without NUMTEC barcode.



## Remote maintenance

Optimum access via remote maintenance for quick assistance.





1 Swivel-mounted touch panel  
Optimal operation in all operational modes with swivel-mounted control panel



2 Maintenance door  
Generously dimensioned access door to ensure excellent accessibility for maintenance purposes



3 Control cabinet  
Integrated in machine, saving space



4 Wheel detection  
Identification of the wheel type with barcode or camera system in the first roller conveyor segment

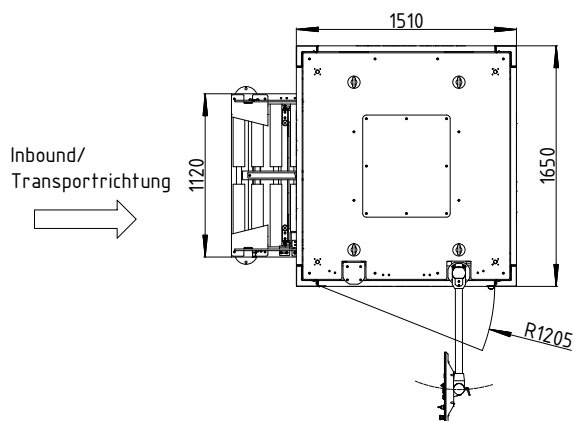
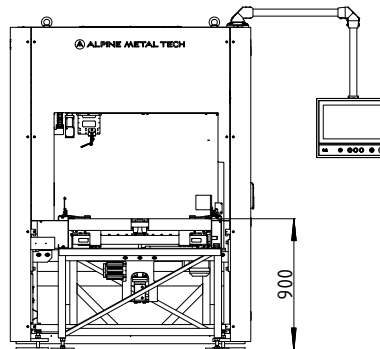
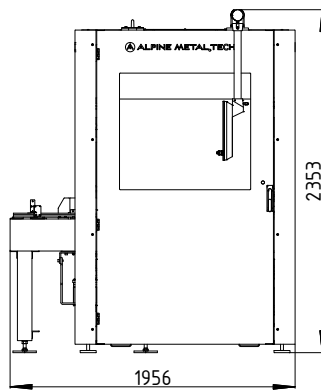


5 Wheel measurement  
Contact-free measurement with NUMTEC laser unit in the second roller conveyor segment

# TECHNICAL DATA

Machine features	measurement method	laser sensor, triangulation procedure
	measuring characteristics	flatness of the outboard flange distortion in the cap area, sprue check
	measuring positions on the wheel	1. on the visible outboard flange 2. in the cap area
	type detection	NUMTEC barcode or camera system (optional)
Wheel parameters	wheel diameter	14 – 23"
	wheel height	5 – 11"
	wheel weight	max. 35 kg
Performance characteristics	machine capacity	180 wheels/hour
Technical components	HMI	19" touch display
	machine control system	industrial PC (Windows) and PLC
Interfaces		Profibus, Profinet, EtherNet/IP, Parallel I/O
Media	electrical connection	3 x 400 VAC, 50 Hz, 2 kVA optional 3 x 400 – 480 VAC, 50/60 Hz, 2 kVA
	pneumatic connection	at least 6 bar
Machine dimensions	L x W x H	1956 x 1650 x 2353 mm
Weight		1500 kg

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