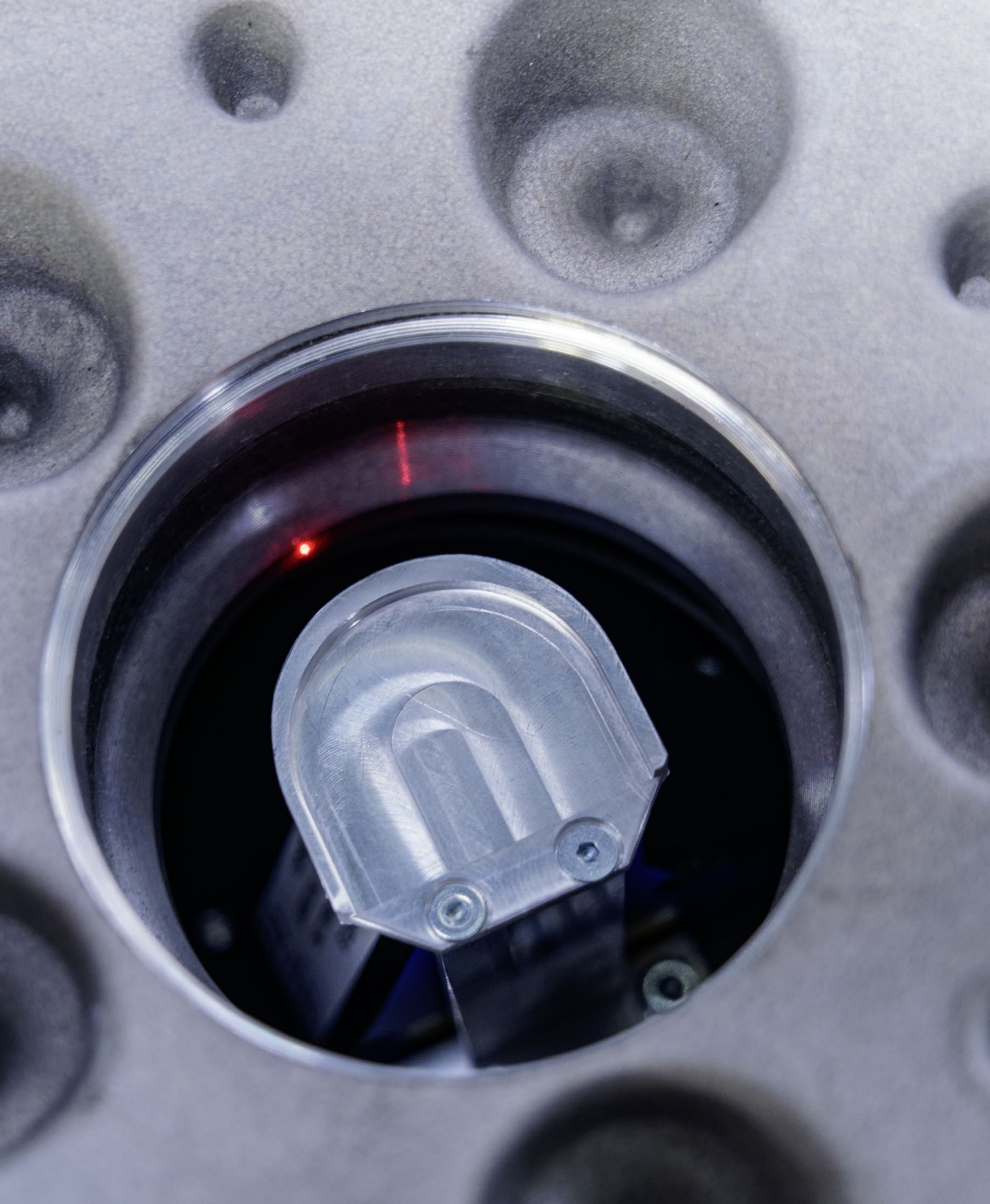


MD422

Center bore measurement





The MD422 allows the fully automated measurement of the wheel center bore for chaotic processing cells.

MD422

Center bore measurement

The NUMTEC MD422 measuring machine is a system for the fully automated center bore measurement of the wheel hub in the processing cells. To implement the automation trend toward chaotically fed processing cells in wheel production, the hub borehole measurement in every cell is unavoidable. With the MD422, it can be done.

The system is loaded by a robot or via conveyors; after that, the centering and lowering into the measuring position takes place. 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 that was specially developed for this application. In order to be able to correct the center bore within the

control limits, 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 the drilling. Then the wheel is lifted into the removal position and from there, it can be removed by robot or conveyed to the rejection conveyor. With an automatic calibration device, the function of the system is checked at regular intervals using a setting ring. Thanks to the compact design of the machine with 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. This means that all measured data can also be accessed from the existing network.

YOUR ADVANTAGES

» Laser measurement

The measurement is performed with a contactless laser sensor without mechanical wear.

» Chaotic production

The measuring system can chaotically measure wheels with a hub diameter of 48 to 85 mm -> no retooling time is needed. The center bore range is corrected within the control limits by the calculated correction values.

» Automatic monitoring of the calibration

At regular intervals, the function of the system is checked on an automatic calibration device.

» Fully automatic processing cell

With this complete station, a chaotically fed, fully automated processing cell can be realized.

» Valve hole positioning

Optional camera system for positioning the valve hole for drilling

FEATURES

Center bore measurement

The measurement takes place with a contactless laser sensor that is protected from contamination by a protective mechanism. After the wheel was put down by the robot, it is centered and lowered into the measuring position by means of support bars on the rear flange. The laser approaches the measuring position that was taught-in on a wheel-specific basis. By a 370° rotation of the laser sensor, a center bore range of 48 mm to 85 mm is measured without retooling. Due to the large diameter range, the system is ideally suited for cells with constantly changing wheels.



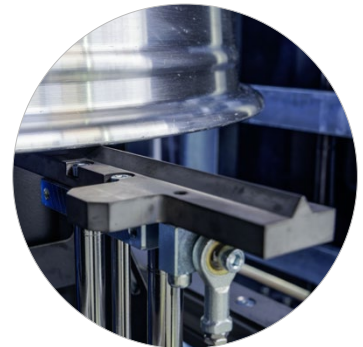
Control / visualization

The system is controlled via an industrial PC, coupled with a PLC. All existing components are directly connected to the PC. The software combines the functions of system control, center bore measurement and visualization of the operating status of the system. Status, measurement results and error messages are displayed. The level of center bore measurement can be set by means of a wheel-specific measurement program. All measured data are stored in a database and can be consulted for analysis.



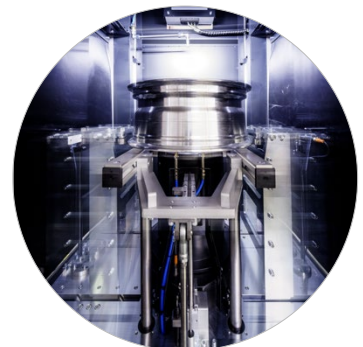
A-value measurement

When the wheel is lowered into the measuring position, the A-value is measured by a cylinder with low counterpressure on the rear flange. The calculated value can be used for the downstream drilling machine, for instance. This ensures that the residual wall thickness of the holes is within the tolerance ranges.



Lifting unit

The pneumatically driven lifting unit moves the wheel from the robot transfer to the measuring position. The unit is equipped by default with support bars and optionally available with a conveyor belt.



OPTIONS

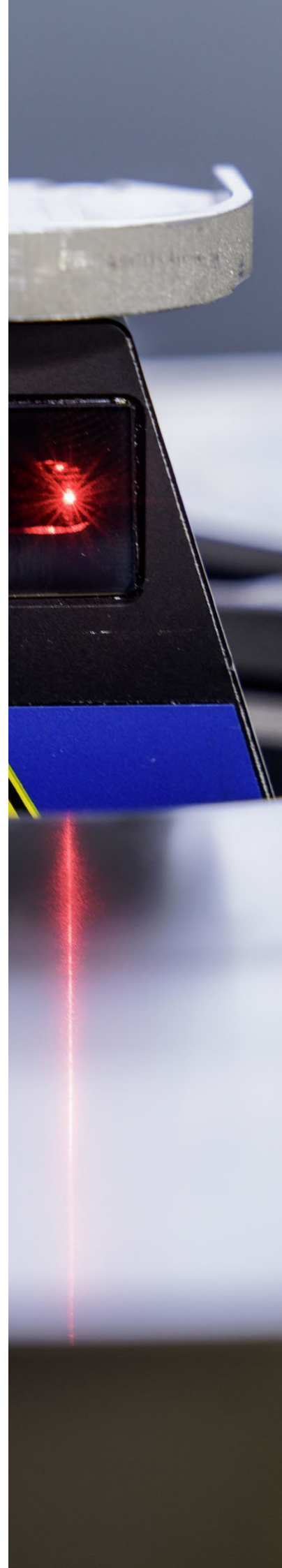
Conveyor belt

The wheel placed by the robot is centered, lowered to the measuring position at the rear flange and then lifted back to the insertion position. If the machine is set up at the cell outlet or if NOK wheels need to be rejected, the wheel is discharged onto the outbound conveyor by a conveyor belt after the measuring sequence.



Valve hole positioning

The valve hole position is detected by an additional camera system, and the integrated rotation unit positions the wheel. When taking the wheel from the robot, another picture is taken in order to correct gripping uncertainties. With this process, the wheel is inserted exactly into the drilling machine on the basis of the angle correction.

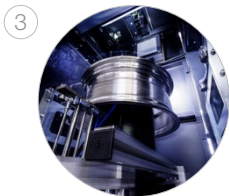




Control system /
Visualization /
Trend value generation



Centering unit



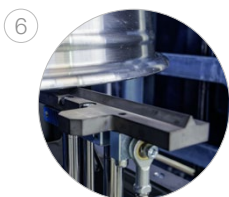
Valve hole positioning
(optional)



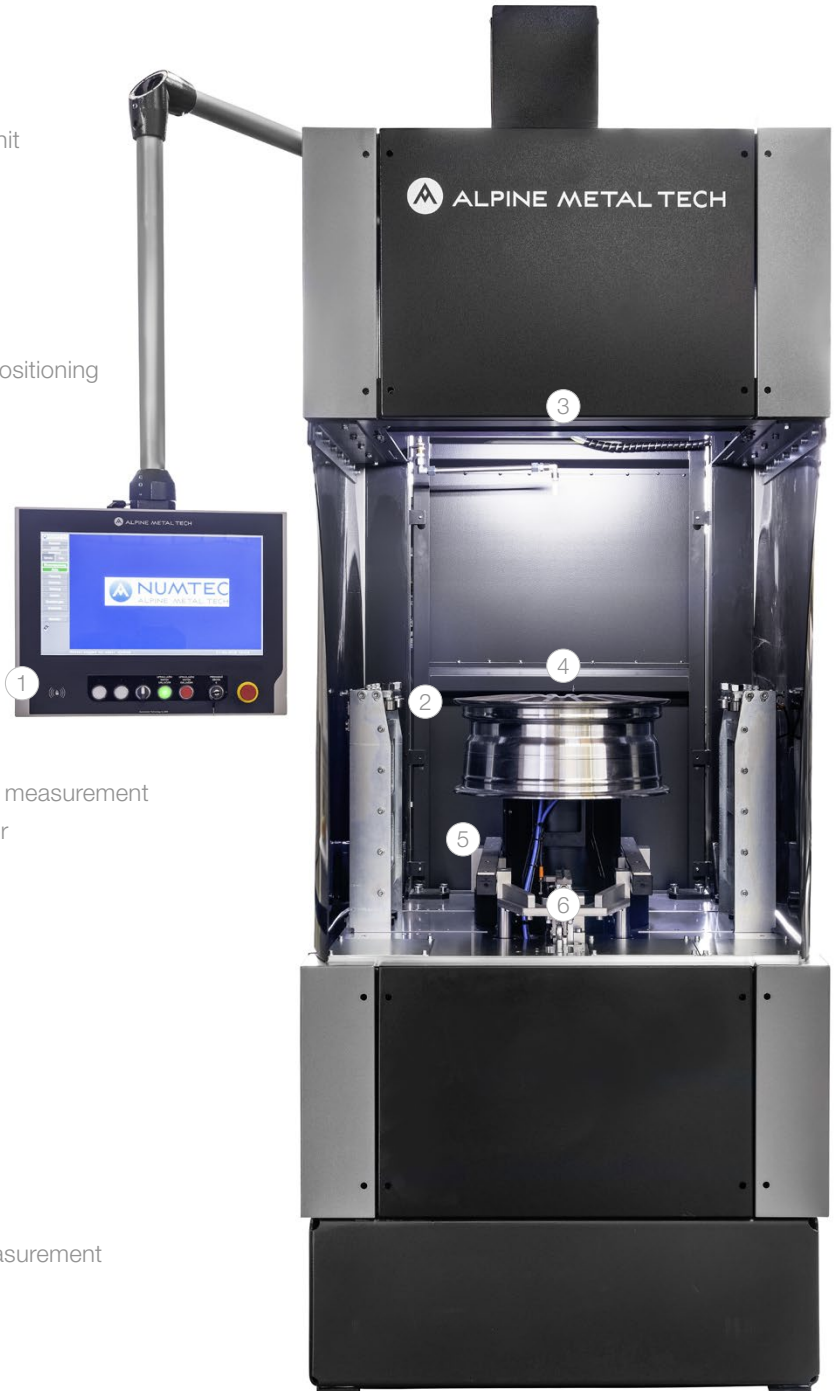
Center bore measurement
Laser sensor



Lifting unit



A-value measurement

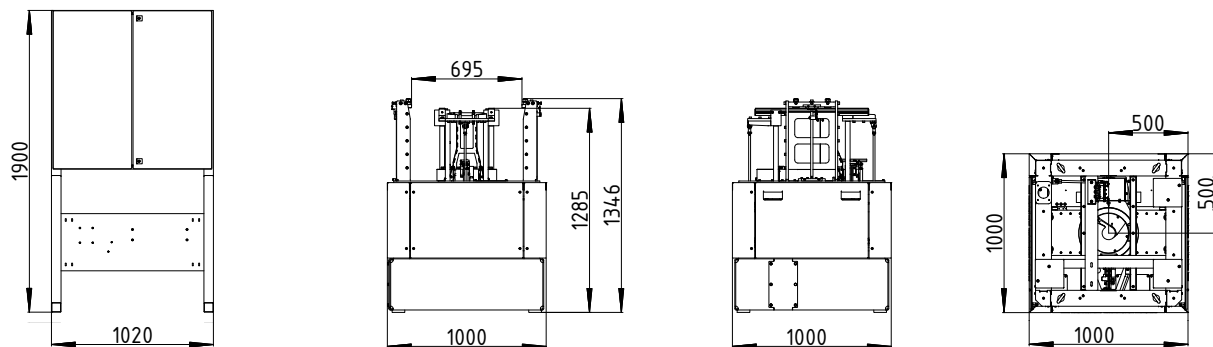


TECHNICAL DATA

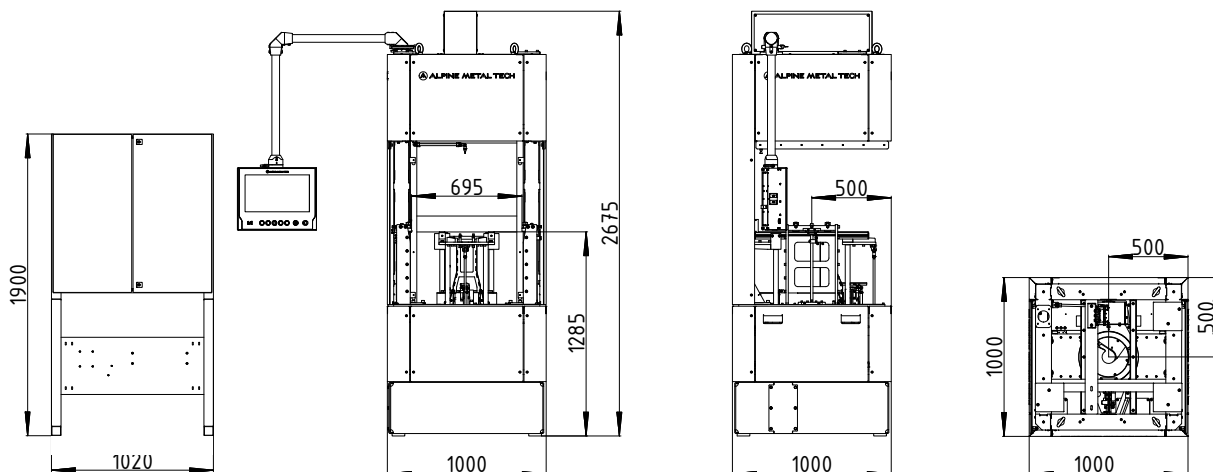
Machine features	measurement method	triangulation laser / path measuring system / camera (option)
	measuring characteristics	wheel hub / A-value / valve hole position (option)
	measurement positions	center bore: \varnothing 48 – 85 mm / A-value: 48 – 280 mm
Wheel parameters	wheel size	14 – 24" without retooling
	wheel weight	max. 45 kg
Performance characteristics	system capacity	approx. 70 wheels/hour
Technical components	HMI	19" touch display
	control system	industrial PC (Windows) and PLC
Interfaces		Profibus, Profinet, EtherNet/IP
Media	electric 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	1000 x 1000 x 1346/2675 mm
Weight		850 kg

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MD422 standard



MD422 including optional valve hole positioning



Alpine Metal Tech GmbH

Buchbergstraße 11

4844 Regau, Austria

Tel.: +43 7672 78134-0

E-mail: office@alpinemetaltech.com

Web: www.alpinemetaltech.com

