

# ABV300

Inline sprue drilling machine





The ABV300 is a powerful drilling machine with an automatic tool changer for removing the sprues from aluminum wheels.

# ABV300

## Inline sprue drilling machine

**The ABV300 was developed for drilling out the sprues of aluminum wheels after the casting process. The powerful inline sprue drilling machine is unique on the market and sets new standards in terms of cost-efficiency and flexibility.**

Usually, sprues are removed by punching, which can cause distortion and cracks in the aluminum. This risk is effectively prevented by drilling. In addition, drilling out the sprues allows considerably more possibilities in terms of the design and size of the sprue cross-sections. The robust spindle installed in the ABV300 can handle diameters of up to 100 mm, making it ideal

for the big wheels and thicker material thicknesses in the hub area.

With the automatic tool changer and the integrated wheel detection system, each wheel is machined with the appropriate bore diameter. Bringing the bore diameter closer to the finished hub diameter achieves cycle time savings in the subsequent turning operations.

Optional features such as minimum quantity lubrication, chip conveyor or exhaust device allow individual adaptation to the different conditions of the production plants.

## YOUR ADVANTAGES

### » Inline machine

The ABV300 is installed directly in the conveyor line. The complete loading and unloading of the drilling unit is integrated in the machine. No external manipulator (e.g. robot) is required.

### » Low material stress

Compared to punching, drilling causes far less material stress in the hub area. Even with large material thicknesses, there is no risk of distortion or cracking in the aluminum.

### » Flexible production with tool changer

With the built-in wheel detection system and the fully automatic tool changer with integrated 12-tool magazine, each wheel can be machined with its optimum drilling diameter.

### » Maximum throughput

Maximum production rates are achieved through consistent development for this application. With just one ABV300, approx. 4500 wheels per day with different hole diameters can be drilled.

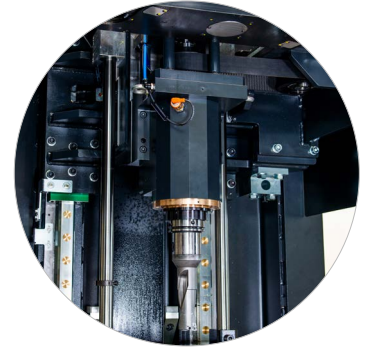
### » Cycle time savings in turning operations

The drilling diameter can be better approximated to the finished hub diameter. This saves valuable cycle time in the turning operations for wheel machining.

# FEATURES

## Drilling spindle

For the drilling process, the ABV300 is equipped with a 40 kW servo motor. The spindle with HSK100A tool holder can transmit a torque of up to 260 Nm to the tool. To prevent damage to the drilling tool, the maximum torque can be reduced to the individual tool limit. The spindle is belt driven, making the whole system very robust and perfect for harsh production environments. In addition, the spindle unit is easy to operate in the event of maintenance.



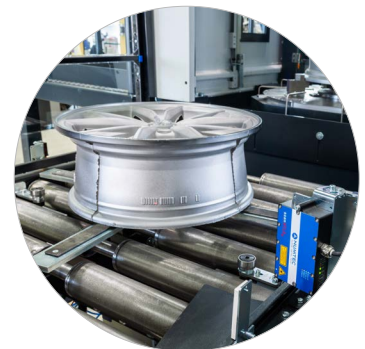
## Automatic tool changer

The machine is equipped with a fully automatic tool changer for drilling specific diameters. In combination with the integrated type recognition, each drilling process can be carried out with a separate tool from the 12 storage places in the changer. The tool change takes place within the loading and unloading time of the wheels and therefore has no influence on the total cycle time of the machine.



## Wheel type identification

The wheel types are identified with a NUMTEC barcode scanner as standard. The wheel is centered and rotated in front of the scanner system. The barcode scanner system can be used with standard monobloc wheels or optionally with an extension for flow forming wheels.



## Wheel exchange system

The wheel exchange system is equipped with flexible PHD grippers. This allows the entire wheel range from Ø 15"-24" to be covered without conversion. To ensure full flexibility with very short cycle times, the two exchange units work completely independently of each other on the loading and unloading side.



## Tool exchange access

The machine door is equipped with a flap with access to the tool magazine. This makes it possible to change tools during active drilling operations without causing downtime.



## Standard tools

Standard tools with cutting inserts can be used for the different bore diameters. In combination with an HSK100A adapter, the drills used can be replaced at low cost.



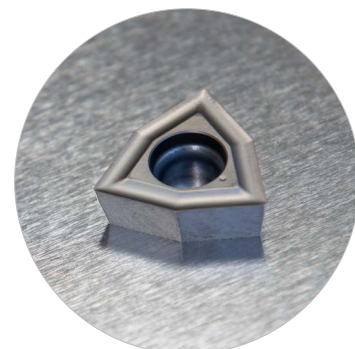
## Step tools

Thanks to the option of using tools with a maximum length of 350 mm, step drills can also be used. In combination with the servo-controlled vertical axis (drill feed) and a 2-step drill, different bore diameters can be realized at the front (= cap diameter) and at the rear (= hub diameter) of the wheel.



## Automatic check of tool wear

During drilling operations, the ABV300 constantly monitors several critical parameters. From the combination of the current torque, the speed and the vibrations on the drill spindle, the respective condition of the active tool can be inferred.



# FEATURES

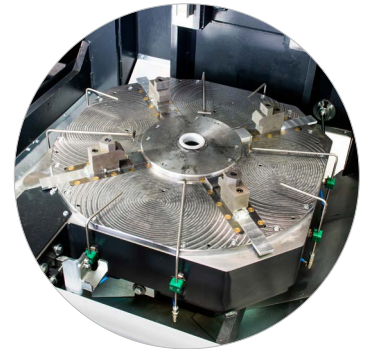
## Protection design side

The wheel is drilled from the inside to the design side. This effectively prevents damage to the design side of the wheel due to chip impact. With the sprue pipe automatically positioned on the wheel surface, the remaining sprue part cannot cause any damage or scratches to the front face of the wheel.



## Clamping device

The high stroke of the hydraulic clamping device makes it possible to clamp wheel sizes from 400 to 700 mm using one-stage clamping jaws. This effectively eliminates downtime due to setup or clamping faults.



## HMI panel

The machine is operated via a portable HMI panel. Therefore, machine movements can be carried out within the direct field of vision of the system operator. The integrated enabling switch allows safe machine maneuvering even when the protective circuit is open.



## Operator platform

The front of the machine can be opened for maintenance and cleaning work. Access is via a platform with a standard staircase. The doors are equipped with viewing windows through which the drilling process can be followed.



## Infeed and outfeed conveyor

At the loading side, a turning device for wheel identification and pre-positioning is installed, which ensures that the wheels are always gripped outside the parting lines. The unloading side is equipped with a chips collection system.



## Safety fence

The machine guard is divided into two protective areas on the loading and unloading side. These can be accessed separately via safety doors for maintenance and cleaning work.



## Hydraulic unit

The machine is equipped with a hydraulic unit for clamping the wheels and drilling tools. Automatic fill level, temperature and filter monitoring provides information on necessary maintenance work.



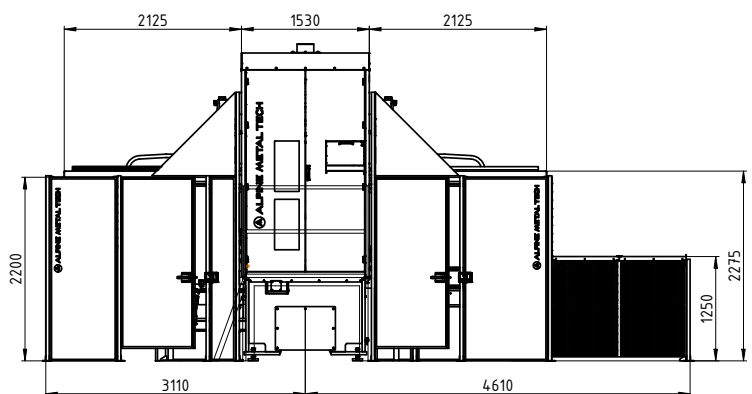
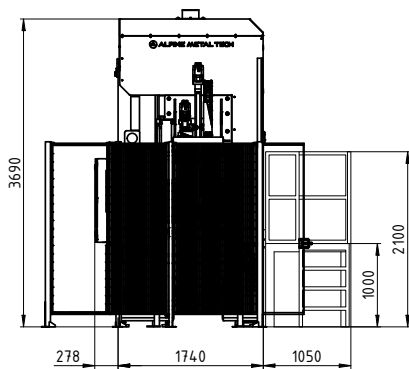
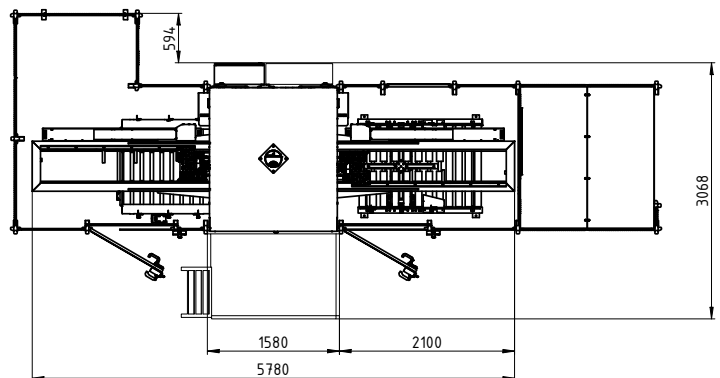
## Chip conveyor (option)

The machine frame is designed with outlets for standard chip conveyors. The necessary conveyor units can be integrated into the Alpine Metal Tech scope of delivery on request. However, these devices can also be sourced from any local manufacturer according to the specifications in the layout.





- ① Infeed conveyor
- ② Outfeed conveyor
- ③ Wheel type identification
- ④ Wheel exchange system
- ⑤ Drilling spindle
- ⑥ Automatic tool changer
- ⑦ Clamping device
- ⑧ Operating platform
- ⑨ Tool flap
- ⑩ Safety fence
- ⑪ Control cabinet





# TECHNICAL DATA

Machine features	machine type	inline sprue drilling machine with automatic tool changer
	drilling spindle orientation	vertical
	clamping device	hydraulic clamping system
	drilling spindle	powerful belt-driven spindle with HSK100A tool interface including cooling channels for coolant transport to the tool spindle power: S6 mode max. 40 kW
	vertical drilling axis	servo driven spindle axis drilling speed: ~1 – 20 mm/sec acc. tool rapid movement: up to 300 mm/sec
	tool changer	automatic tool changer with 12 storage places changing time within total cycle time
	wheel type identification	turning unit with built-in NUMTEC barcode scanner system for reading of mould no.
	machine control system	Siemens S7-1500 PLC
	machine operator panel	Siemens mobile panel
Wheel parameters	wheel diameter, outer flange	410 – 700 mm (approx. 15" – 24")
	wheel height	3.5" – 14" (100 – 420 mm)
	overhang of design to outer flange	max. 45 mm
	wheel weight	max. 45 kg
	max. sprue length	depending on tool length
	max. sprue diameter	60 mm, with reduced drilling speed up to 100 mm
Performance characteristics	wheel drilling cycle time	18 – 20 sec, depending on sprue drilling depth (e.g. 19 sec for 80 mm drilling length) drilling speed 12 mm/sec including tool changing time
	total machine capacity	190 wheels/hour, based on the above mentioned wheel data
	tool change cycle time	included in the standard cycle; no extension of the total cycle time due to tool change
Tool parameters	tool interface	HSK100A
	tool length	200 – 350 mm (from spindle motor flange)
	tool weight	max. 25 kg
	cooling	minimum quantity lubrication system
Interfaces to plant		Profibus, Profinet, EtherNet/IP, Parallel I/O
Media	electric connection	3 x 400 VAC, 50 Hz, 70 kVA optional 3 x 450 – 480 VAC, 50/60 Hz, 70 kVA
	pneumatic connection	compressed air or nitrogen class 4 according DIN ISO 8573-1 at least 6 bar (max. 10 bar)
Machine dimensions	machine	5780 x 3068 x 3690 mm (L x W x H)
	control cabinet	2000 x 600 x 2624 mm (L x W x H)
Weight	machine	9800 kg
	control cabinet	1200 kg

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