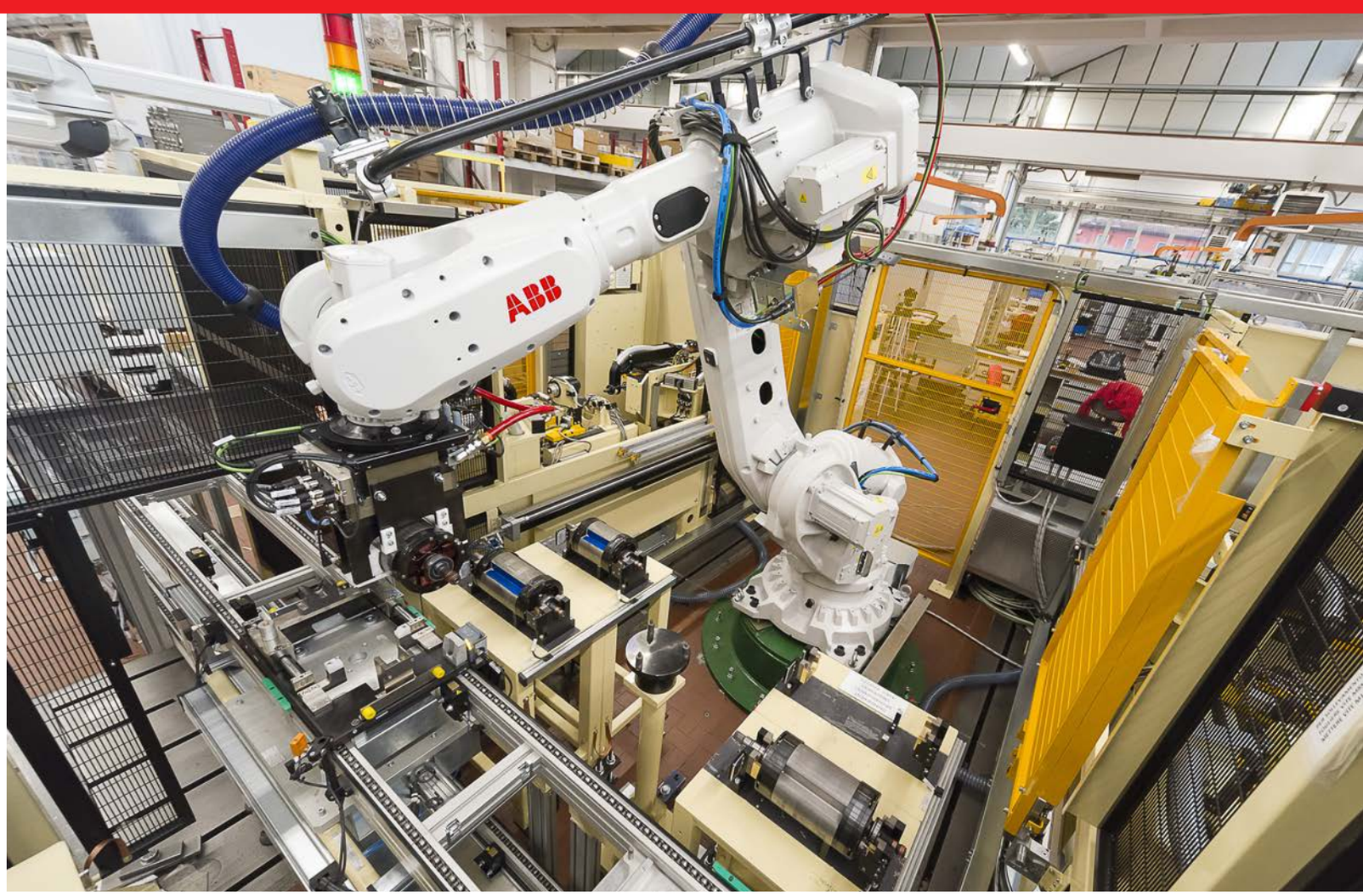
# Automatic balancing machines for electric motors




CEMB

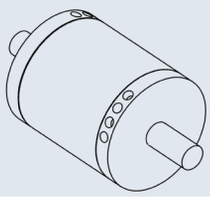
BALANCING MACHINES

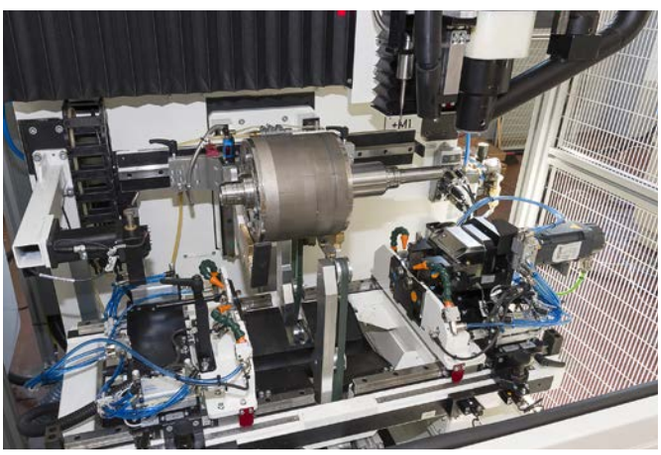
# Automatic balancing machines for electric motors

Our range of balancing machines for electric motor rotors offer the possibility to correct the unbalance by radial drilling unit, by side milling unit, by axial drilling or by adding clinched plates.

## Balancing machine equipped with a **radial drilling** correction unit - Models ZB/TOK 20 - ZB/TOK 50

Balancing machine, measuring the unbalance on two planes, with tangential belt drive and equipped by a vertical drilling unit with controlled axes.



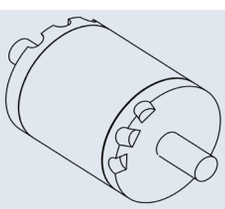



**OPTIONS:**

- Automatic axial translation of the pedestals with their rollers carriages.
- Automatic deburring unit with devoted cycle.
- Position reader unit for the direct drilling of metal sheets, even in oblique configuration.
- Side feeler unit for drilling on limited thickness crowns.
- Cooling of the drilling bit by an MQL minimal system.
- Automatic lifting system for release/picking of the parts on the roller carriages.
- Integral safety guard complete with front pneumatic shield.
- Swarf extractor.

## Balancing machine equipped by a **side milling** correction unit - Models ZBK 5/UFA - ZBK 20/UFA

Balancing machine, measuring the unbalance on two planes, with tangential belt drive, equipped by a vertical correction unit for side milling and controlled axes.

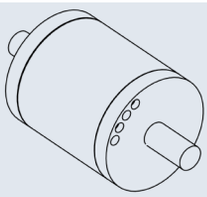


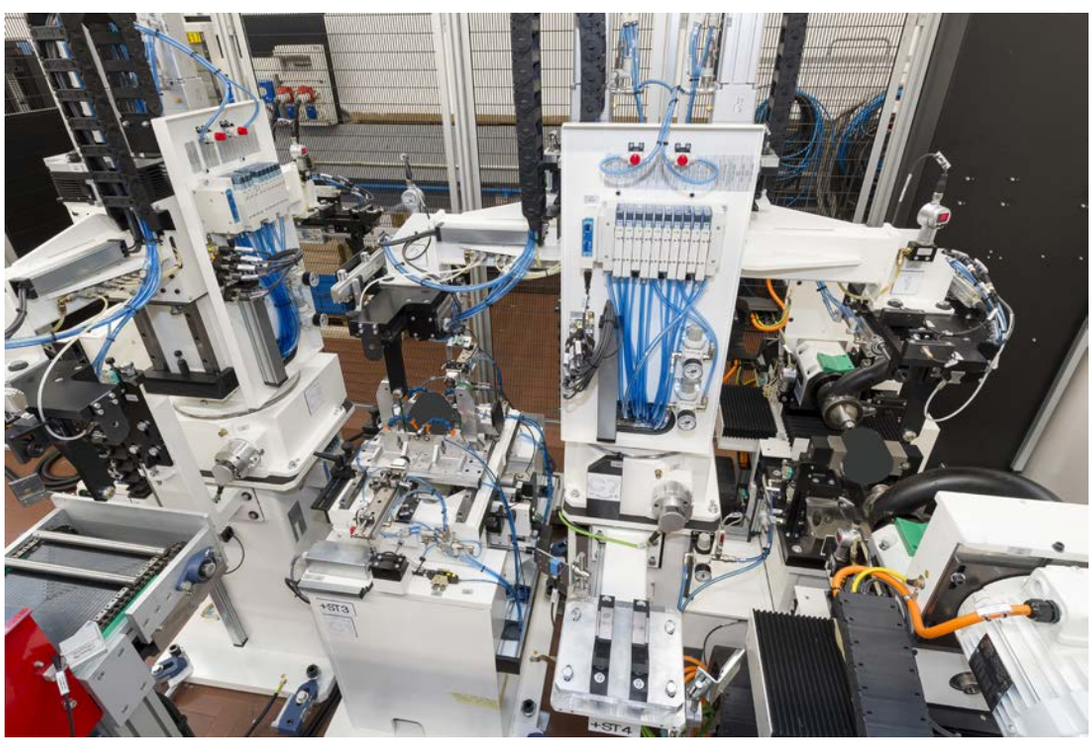
**OPTIONS:**

- Automatic axial translation of the pedestals with their rollers carriages.
- Side feeler unit for the highest accuracy in the material removal.
- Automatic lifting system for release/picking of the parts on the roller carriages.
- Integral safety guard complete with front pneumatic shield.
- Swarf extractor.

## Balancing machine equipped by an **axial drilling (or/and) milling** correction unit - Model ZBTOK20/2UO-A/C/2ST

Balancing system for electric rotors consisting of two stations, one for unbalance measurement on two planes with belt drive and one unbalance correction station for axial drilling on the sides through two opposed units with controlled axes.





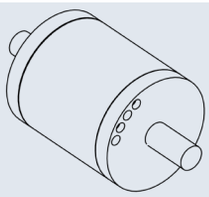

The plant is equipped with two rotary loaders, the first one that picks up the piece from the customer's pallet line and places it on the measurement station and the second that transfers the piece from the measurement station to the correction station.

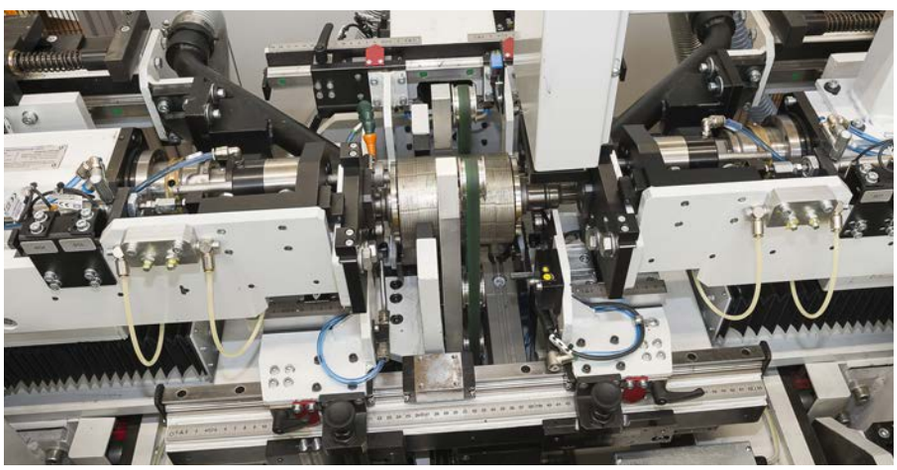
*In particular, the measurement station is equipped with:*
- Quick, precise and supervised manual displacement of the supports with roller carriages to setup the machine to the piece to be balanced.
- Automatic lift to deposit/pick up the pieces on roller carriages.
- Electronic index system to avoid areas of the piece where correction is not possible.

*Main features of the correction station are:*
- Piece touch system on both the sides for more precise drilling depth.
- Opposing drilling units, each moved by a two-axis system that allows simultaneous correction on the two planes.
- Possibility of adding a deburring unit to each drilling unit.
- Possibility to perform correction with radial or contouring millings.
- Swarf extractor to avoid piece contaminations.

## Balancing machine equipped by an **axial drilling** correction unit (one station version) - Models ZBTOK20/2UO

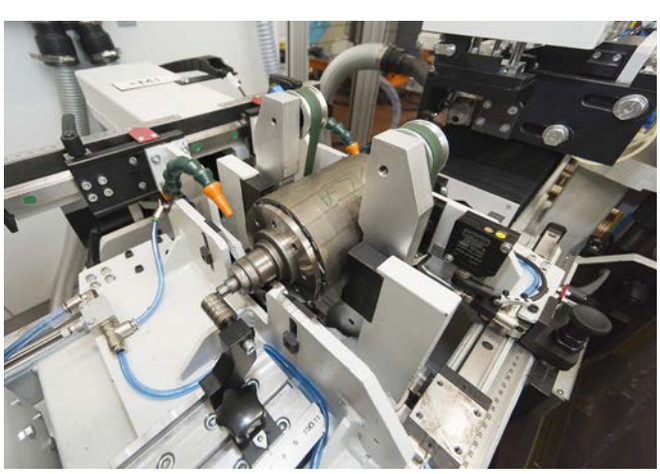
One station balancing machine, measuring the unbalance on two planes, belt drive, equipped by two opposite axial drilling units for correction on both side and with controlled axes.





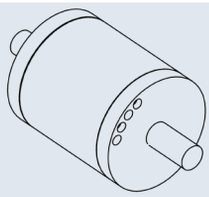
**OPTIONS for:**

- Manual axial translation of the pedestals with their rollers carriages.
- Side touch unit for the highest accuracy in the drilling depth.
- Manual adjustment of the drilling unit on the required correction holes radial position.
- Electronic indexing system to avoid areas of the piece in which the correction is not allowed.
- Automatic lifting system for release/picking-up of the rotor on/from the roller carriages.
- Perimetral fence type safety guard with pneumatic opening and closing front shield for manual loading/ unloading of the piece on the lift.
- Swarf extractor.

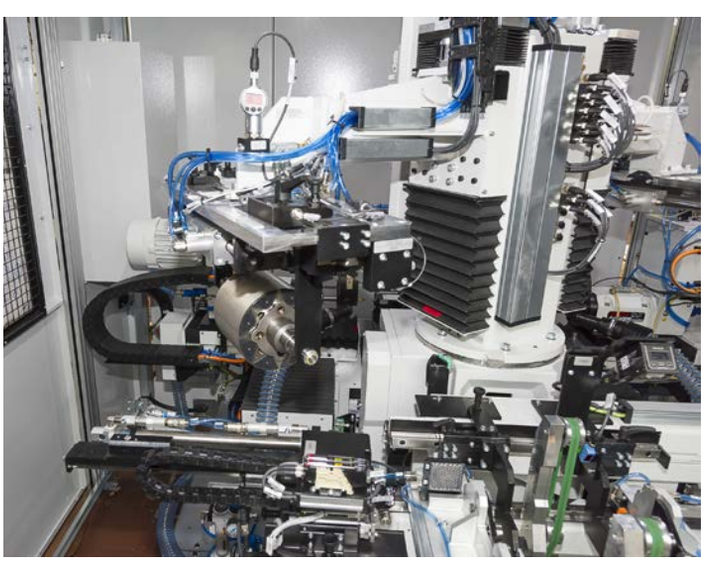
## Balancing machine equipped by an **axial drilling** correction unit (two station version) - Models ZB/TOK20/2ST/2UO

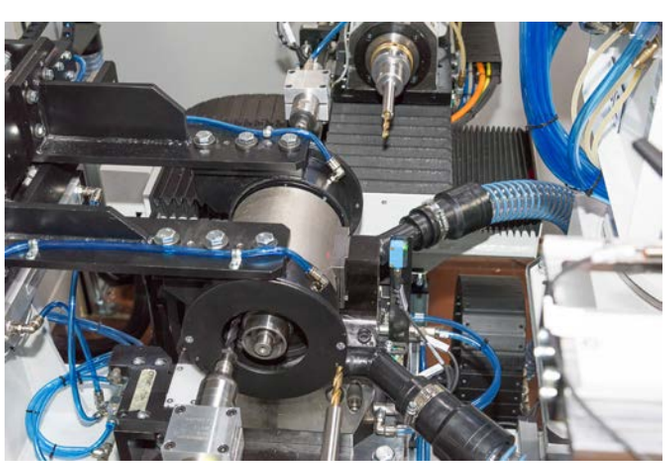
Two station balancing machine, measuring the unbalance on two planes, belt drive, equipped by two opposite axial drilling units for correction on both side and with controlled axes.




**OPTIONS:**

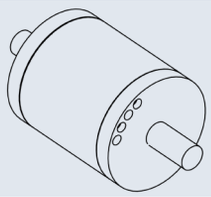
- Balancing machine with roller carriage pedestals.
  Manual axial translation of the pedestals.
  Belt drive for piece rotation and for angular positioning.
  Automatic lifting system for release/picking-up of the rotor on/from the roller carriages.
- Loader with two 180° arms for loading-unloading between measurement station and correction station.
- Electronic indexing system to avoid areas of the piece in which the correction is not allowed.
- Correction station for rotor axial drilling. It is composed of two opposite units, each one installed on three controlled-axis slides. The piece is blocked in fix position by a pneumatic jaw. The two units can carry out fully automatic drilling or milling for correction on 360° without need to rotate the rotor for different position drills.
  Sides touch unit for the highest accuracy in the drilling depth.
- Swarf extractor to remove swarfs from the drilling station.
- Full type safety guard with pneumatic opening and closing front shield for manual loading/unloading of the piece on the lift.





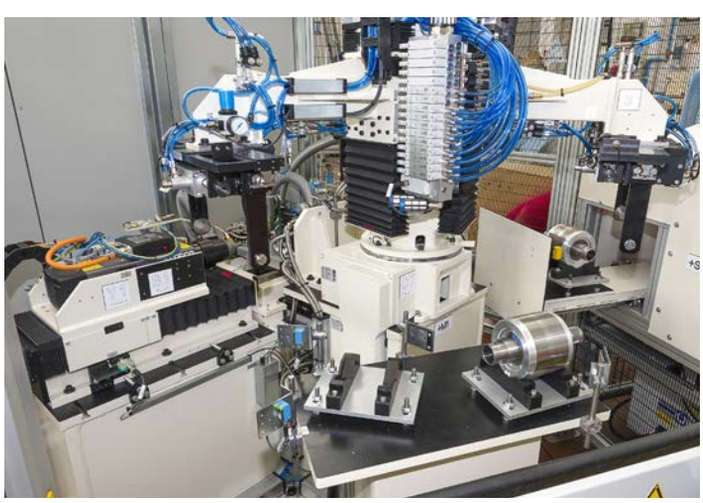
# Automatic balancing machines for electric motors

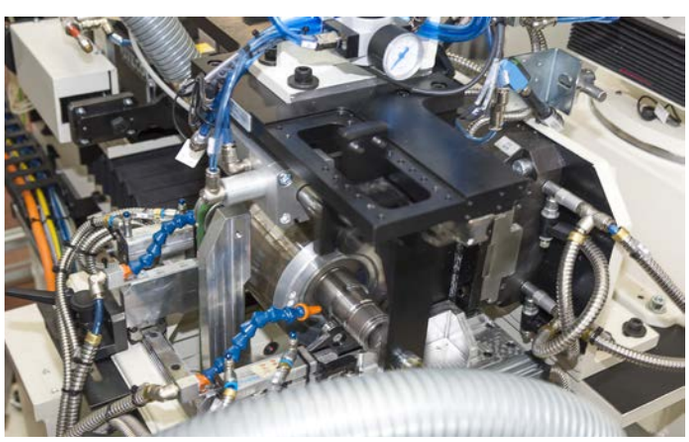
## Balancing machine equipped by an **axial drilling** correction unit - Model ZB/TOK20/2UO-A/C



Balancing system for electric rotors consisting of three stations, one for loading/unloading, one for unbalance measurement on two planes with belt drive and one unbalance correction station for axial drilling on the sides through two opposed units with controlled axes.

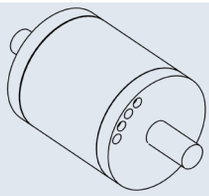

Three station balancing isle for automotive electric motors where the first station is a loading/unloading spot where the rotor is placed either manually or through a robot.
An internal loader takes and transfers the rotor to the second station where the unbalance is measured and, immediately after, corrected by axial drilling on the two balancing ring on the two sides of the rotor stack.
After the correction, the same station also performs the check spin and, if in tolerance, the loader transfers it to the third station where the traceability information are transferred on a QR on the rotor by laser marking.
At the end of this operation the loader places the piece back to the loading/unloading station to be returned to the production line.

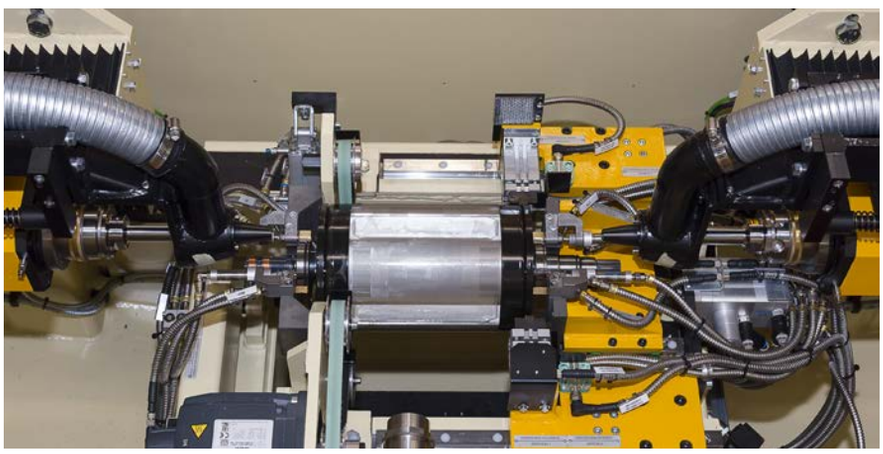




## Balancing machine equipped by **two axial drilling** correction units - Modello 2ZBK100/2UFO/C

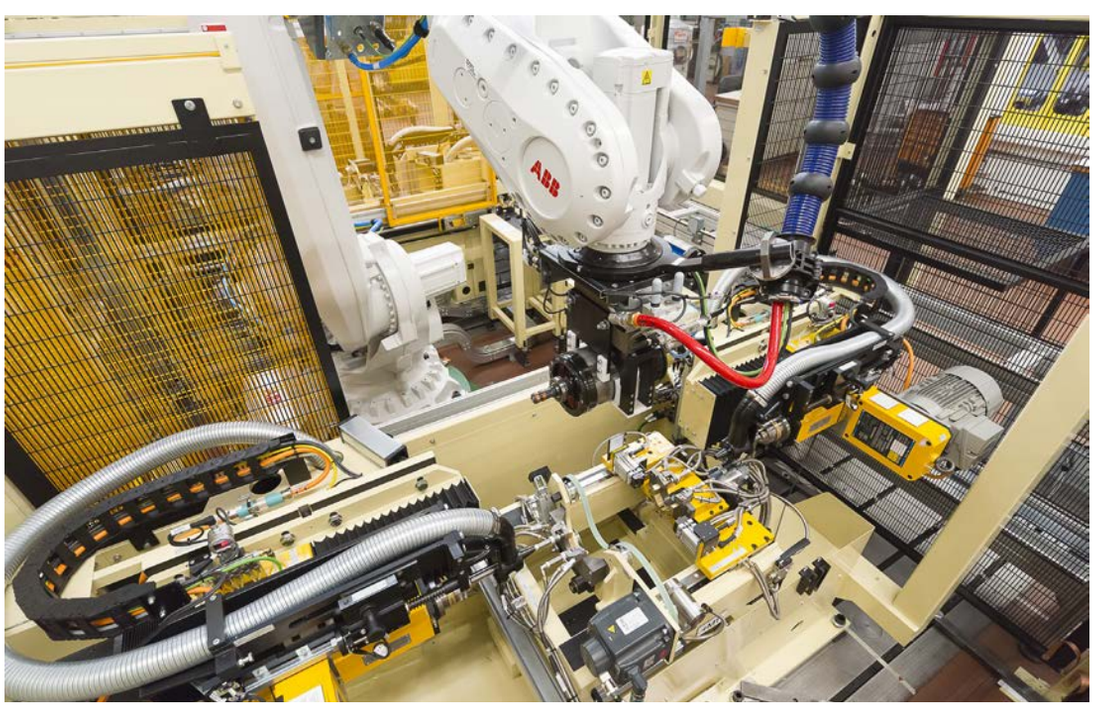
Balancing machine, measuring the unbalance on two planes, belt drive, equipped by two opposite axial drilling units for correction on both side and with controlled axes.



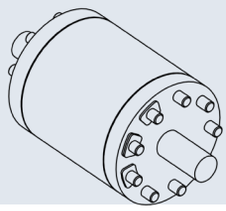


Balancing system composed of robot cell with two balancing machines, each one with unbalance measurement and correction function. The anthropomorphic robot loads and unloads the pieces from the client's pallet line on the balancing machines and can also load the master rotors from internal stores.
The unbalance measurement on two planes occurs with a belt transmission while the correction is carried out through axial drilling of the flanges. For this purpose two opposed controlled-axes units are used.

**OPTIONS:**
- Automatic axial translation of the pedestals with their rollers carriages.
- Special carriages prepared for rotors equipped wiht their own bearings and with the possibility of a pre-load during the measuring spin.
- Side feeler unit for the highest accuracy in the drilling depth.
- Automatic lifting system for release/picking of the parts on the roller carriages.
- Integral safety guard with sliding doors.
- Swarf extractor



## Balancing machine equipped by correction by the adding of **well-known masses** - Model ZBK 20/2ST



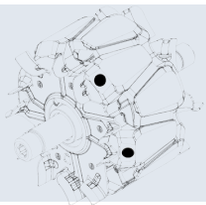
Two stations system with an unbalance measuring station separate from the correction station and with the automatic movement of the parts. Measuring station, measuring the unbalance on two planes, with tangential belt drive. Correction station with part vertically positioned where the correction plates are assembled and fixed by clinching. Displacement and up/down reversing of the part by an anthropomorphous robot equipped with single gripper.

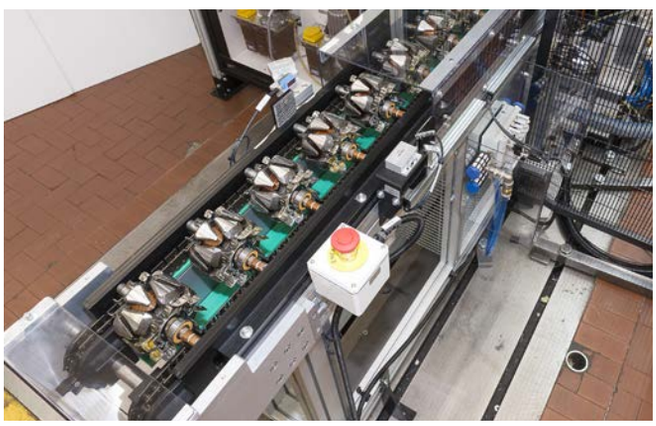
**OPTIONS:**

- Automatic axial translation of the pedestals with their rollers carriages.
- Automatic lifting system for release/picking of the parts on the roller carriages.
- Integral safety guard complete with front pneumatic shield.

## Balancing machine with correction by **oblique drilling**
## - Model ZB/TOK20/TC/4ST

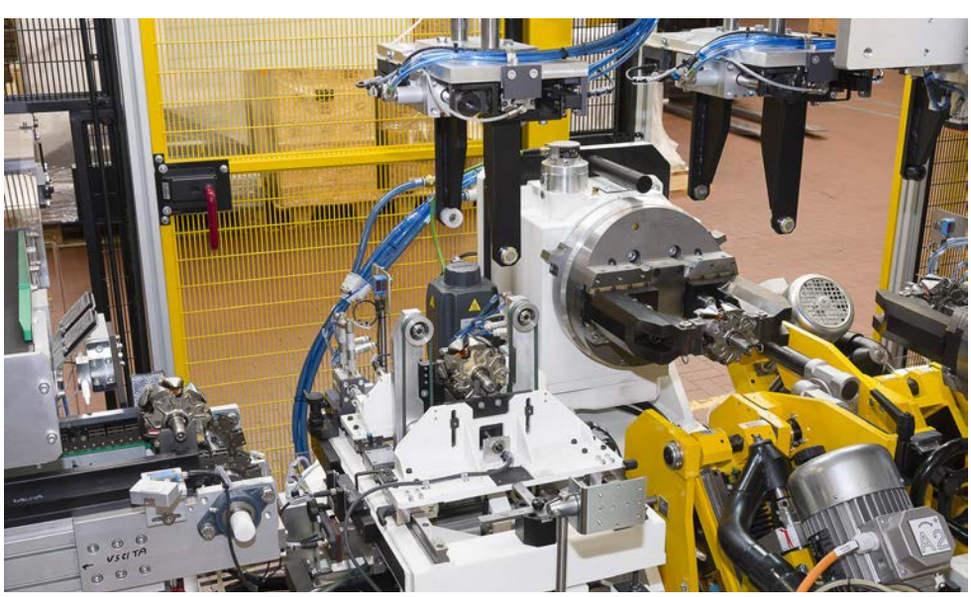
Example of multi-station system for the automatic balancing of rotors for alternators by means of tilted drilling, complete with multi-axis portal loader, which allows the transfer of the pieces to the various stations.





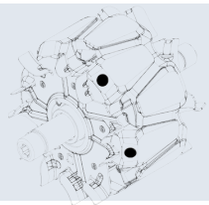
**The entire system consists of:**

- *Input conveyor*, manually loaded (or with robot), transporting the pieces through a chain system with fixed positions.
- *Incoming unbalance measurement station.*
- *Front plane correction station:* the piece firmly locked by a self-centering tool, is corrected through inclined drilling, reducing the unbalance measured on the front plane.
- *Back plane correction station:* the piece is then transferred to the second correction station where the back plane correction takes place.
- *Control station:* a second balancing machine measures the residual unbalance.
- The piece within tolerance limits is transferred from the control machine to the output piece conveyor while any scrap piece is deposited by the portal in a dedicated conveyor.



## Balancing machine with correction by **oblique drilling**
## - Model ZB/TOK20/6ST

Example of multi-station system for the automatic balancing of rotors for alternators by means of tilted drilling, complete with multi-axis portal loader, which allows the transfer of the pieces to the various stations.



**The entire system consists of:**

- *Loading gantry* that collects the piece from a pallet line of the customer and releases it on the measurement station.

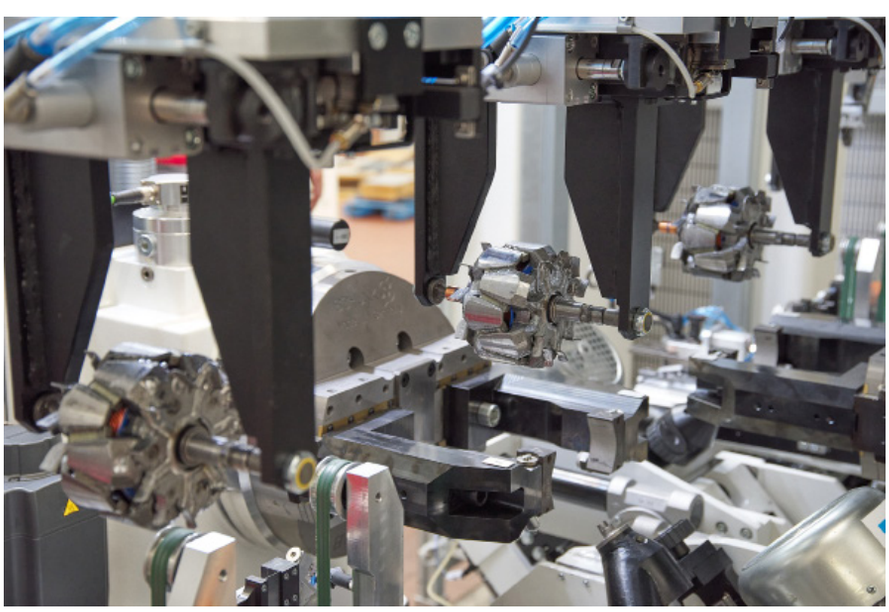
- *Incoming unbalance measurement station.*

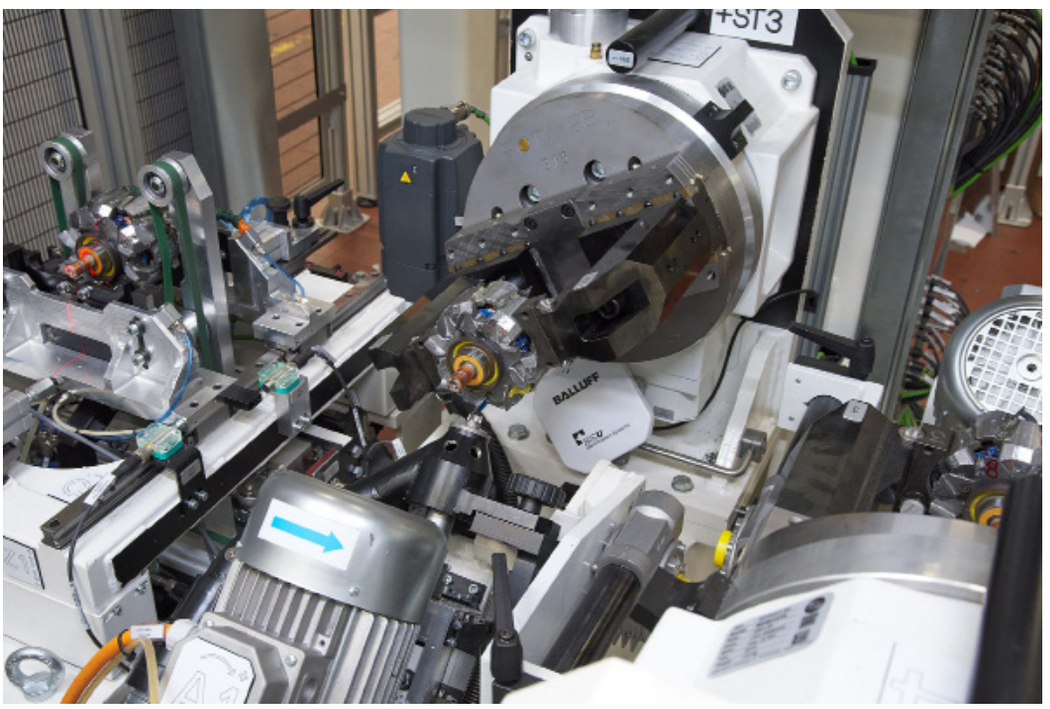
- *Front plane correction station:* the piece firmly locked by a self-centering tool, is corrected through inclined drilling, reducing the unbalance measured on the front plane.

- *Back plane correction station:* the piece is then transferred to the second correction station where the back plane correction takes place.

- *Control station:* a second balancing machine measures the residual unbalance.

- *Unloading gantry* that collects the piece within tolerance exiting the check station and returnes it to the pallet line of the customer to continue the manufacturing process. In case of scrap piece, this is deposited by the portal in a dedicated conveyor.

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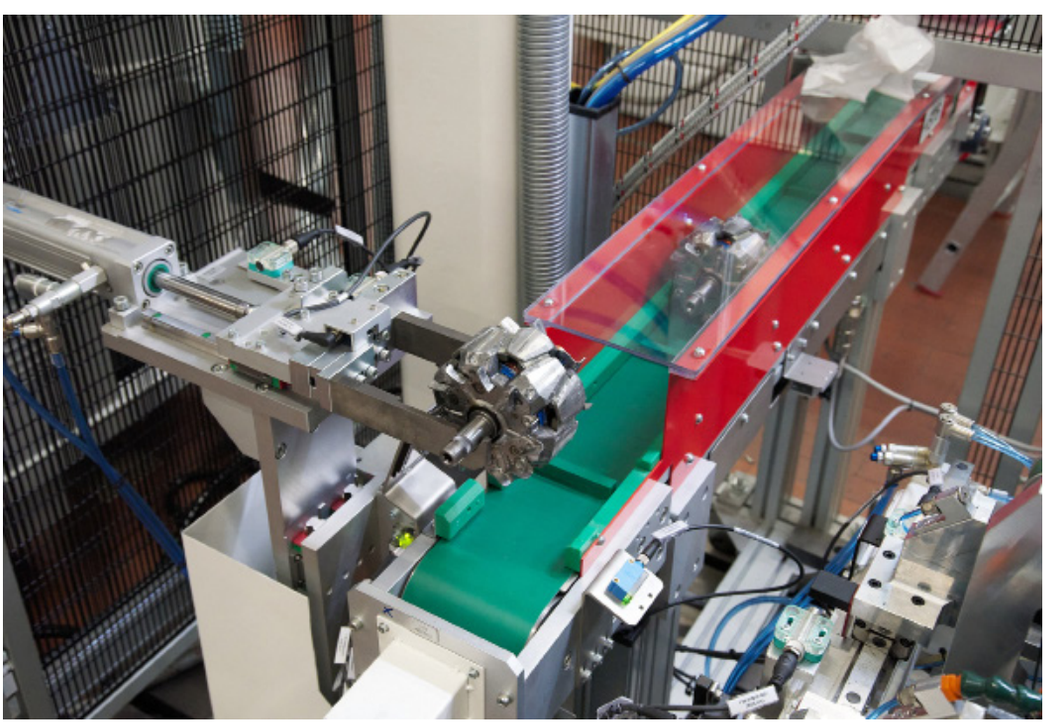

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