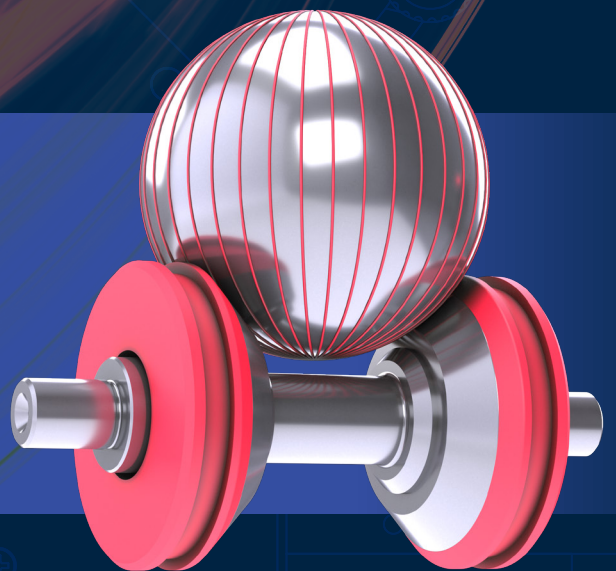


Product Catalog

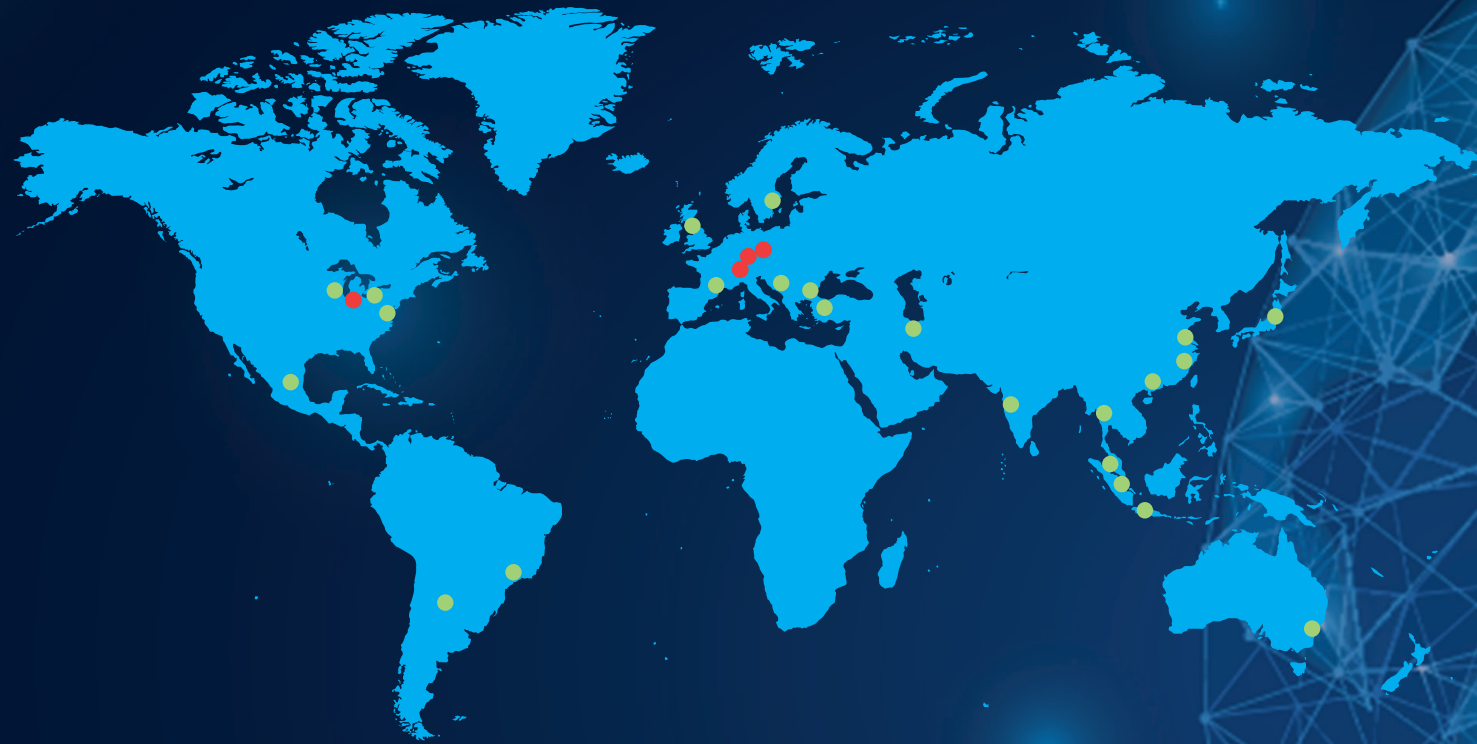
Ball Scanners
Roller Sorters
Special Systems



ibgndt.de

ibg
NDT Technology

Sorting Solutions



● ibg Group ● Partners

Sorting Solutions, founded in 2004, is built on more than 50-years of AVIKO Ball Scanner history. Our primary focus is the production of various machines for NDT quality control such as crack detection, temperline and grinder burn detection, high precision diameter sorting, and various other properties of balls and rollers. Sorting Solutions currently cooperates with more than 50 companies worldwide who are engaged in the production of bearing balls and rollers including other industries such as aerospace, industrial and medical.

Our machines and probes are specially adapted for various materials, whether it be steel, ceramic, glass or plastic.

In addition to our standard products, we also provide special systems according to customer requirement

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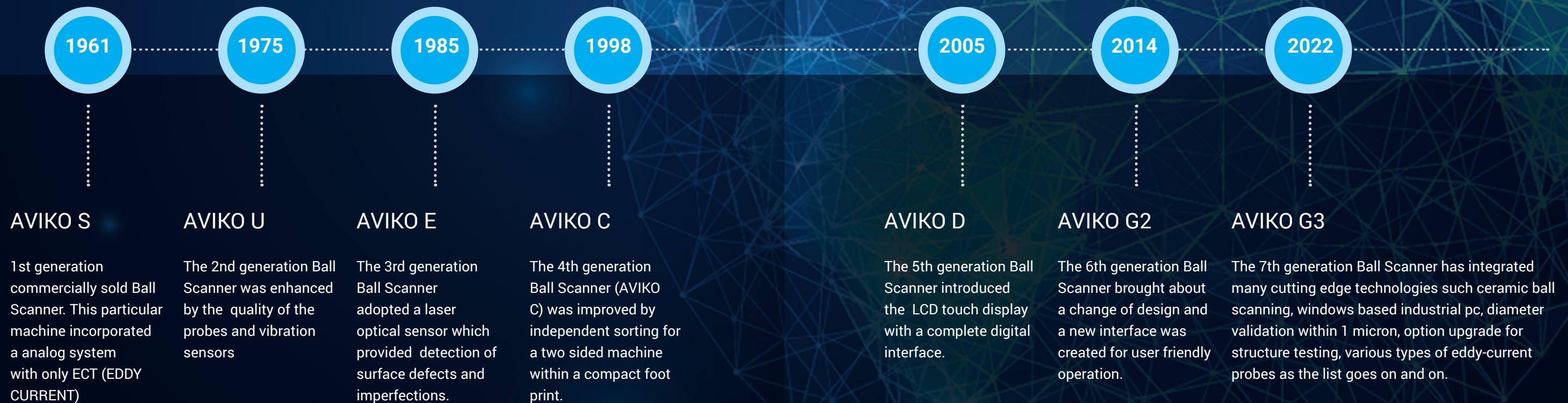
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AVIKO MACHINES TIMELINE

The extensive history of the AVIKO ball scanner originated in 1961 at the former company Somet. At that time, the first AVIKO ball scanner was developed, which was designed for surface and subsurface inspection of steel balls only. The development continued over many years with improved laser optics and vibration controls. As of 2004 Sorting Solutions was originated and carried the Aviko brand until 2018 at which the ibg Group purchased Sorting Solutions and created a new platform for advancement in the technology sector. This latest action has advanced our group to brand new levels putting us above the rest!



Product information

The AVIKO ball scanner is designed for nondestructive high-speed inspection of balls (up to 34 000 pcs/hr.), where the surface and sub surface quality is evaluated using various types of probes. The types of probes that selected are dependent on the type of material of the ball. Additional possibilities are to add accessories for the AVIKO Ball Scanning machine, such as elevators, conservation units, demagnetizers, and packaging machines. A complete line that automates the entire process can be achieved such as demagnetizer, AVIKO Ball Scanner, High precision diameter sorter

and ball packaging running all inline. Thanks to the automation and removal of the human error factor, the scanning of the balls with the AVIKO ball scanner increases the quality, speed and productivity of the entire production process-this is our guarantee! All machines have the ability to be connected to a management evaluation software (Precision Software) for more detailed statistics. We can guarantee 100% surface control thanks to our spinning technology, which is able to inspect the entire surface of the ball. AVIKO ball scanners are divided into several categories, as described below.

AVIKO (Ceramic / Plastic)

AVIKO Ball Scanner - Ceramics is a specially designed machine for non-destructive quality scanning of ceramic balls. With our enhanced laser optics, vibration sensors and eddy current probes we bring all of this data into the processing of the eddyvisor working hand in hand with our industry leading Ai evaluation.



AVIKO (Steel balls)

AVIKO Ball Scanner - Steel is a machine specially designed for non-destructive quality scanning of steel balls. The machine is equipped with three primary sensors: 1. The eddy-currents probe designed for subsurface monitoring of ball (cracks, subsurface defects). 2. The optical probe designed to scan for surface defects (Stains, missing material and different polish or reflection) 3. The vibration sensor is designed to eliminate shape defects as well as missing material. All probes scan the ball at one time within the monitoring point. Once the scan is completed, the balls are sorted either into a good channel or rejected into channels based on eddy current or the optical probe.



AVIKO (Control Roller)

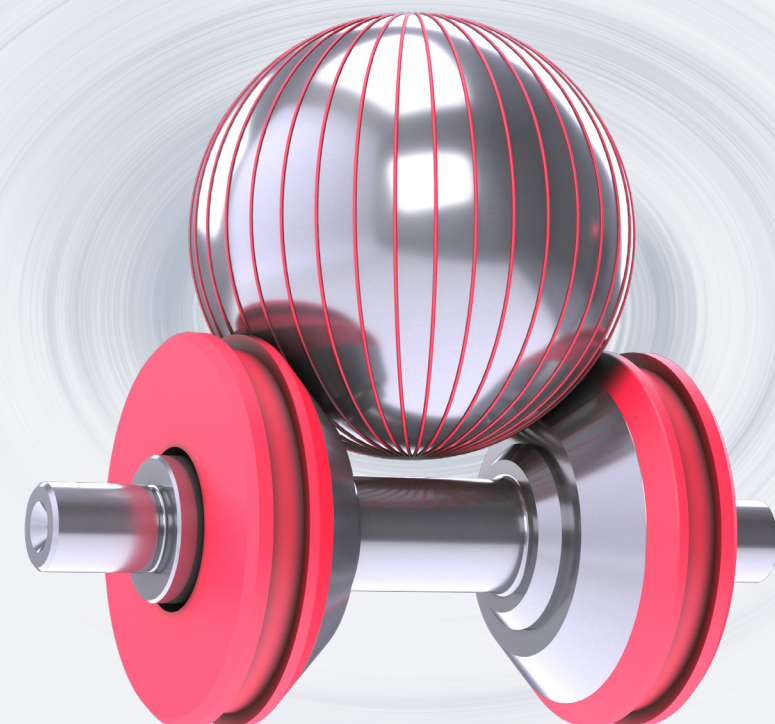
Control roller for AVIKO Ball Scanners are the proven method for the fastest control for balls ranging from 2 to 100 mm. The balls are spun by means of a specially grinded control roller based on the meridian system of rotation and for larger balls, cylindrical rollers are provided with the same meridian system technology. Due to this innovation all of the points of the balls are scanned by the probes. The surface speed during the scanning process is set to 3 m/s, which guarantees maximum speed while maintaining high inspection accuracy. We offer control rollers for AVIKO Ball Scanners in both standard and aerospace options as well as custom settings, which differ in the width of the meridian.

Aerospace Control Roller

Aerospace control roller is designed primarily for ball scanning for the aerospace industry, where precision monitoring comes first. This control roller can also be used for a high quality standard production. The width of the meridian is smaller compared to standard rollers, which increases both the sensitivity of the probe and the repeatability of defects.

Standard Control Roller

Standard control roller guarantees the highest inspection speed (up to 34 000 pcs/h). For more information and ordering information for control rollers please refer to our control roller product catalog.

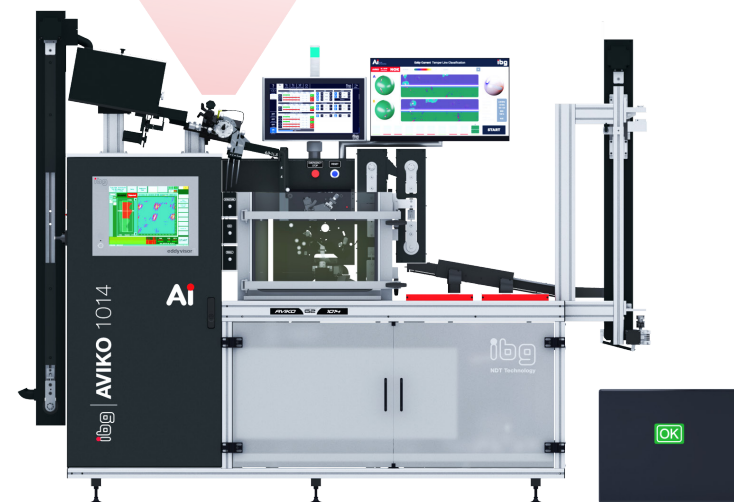
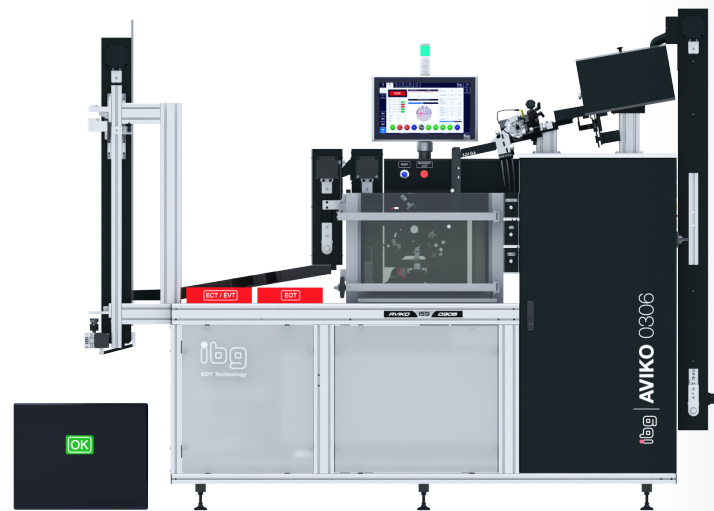
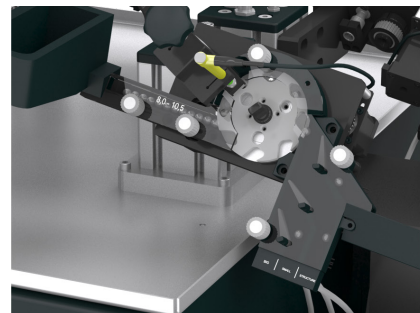


Product information

AVIKO G3 (Wet)

AVIKO WET ball scanner is exciting new development which we are introducing in the year 2023. Due to the popularity of wet scanning, IBG designed a wet ball scanner where the scanning takes place within an oil based solution. Noise-vibration reduction within the wet environment ensures a more precise and reliable inspection. Oil within the tank is monitored by the oil management system. One of many exciting features is that the balls do not have to be dried prior to scanning and in turn pseudo rejects due to stains or dirt are significantly reduced. Optionally the machine can be upgraded for structure sorting, ask for more details.

New presorter with option to add structure test



AVIKO (WET) Ceramic balls

AVIKO WET ceramic ball scanner is one sided machine where the scanning is performed by enhanced electro-optical probe, sub-surface eddy-current probe and specially designed electro-vibration probe. All probes are evaluated by the eddyvisor evaluation unit and sorted based on **Ai** evaluation.

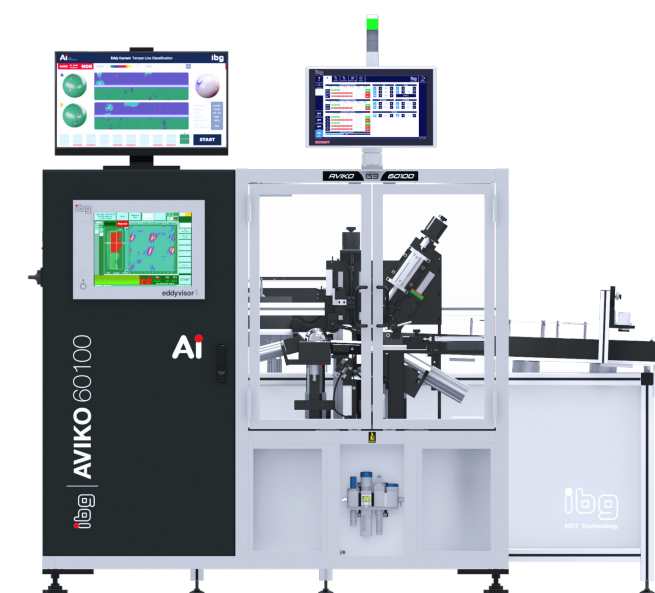
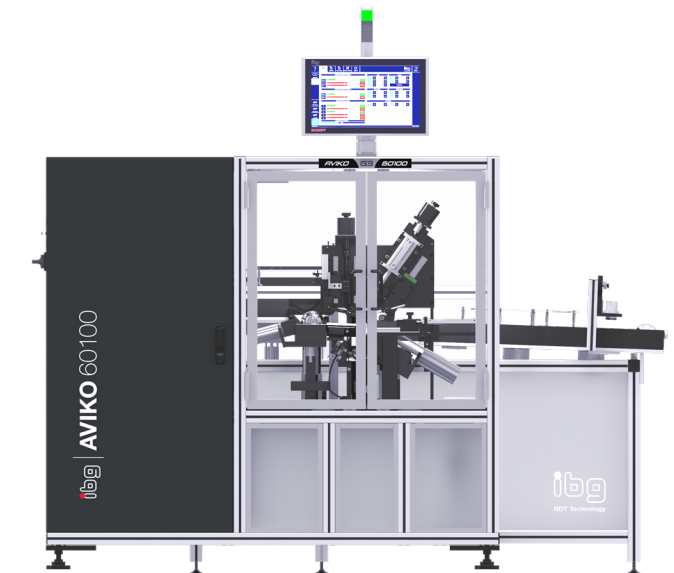
AVIKO WET TYPES	RANGE (mm)
AVIKO 0306 WET STEEL (CERAMIC)	2,778 – 6,350
AVIKO 0610 WET STEEL (CERAMIC)	5,556 – 10,319
AVIKO 1014 WET STEEL (CERAMIC)	9,525 – 14,600
AVIKO 1419 WET STEEL (CERAMIC)	13,494 – 19,050
AVIKO 1830 WET STEEL (CERAMIC)	18,000 – 30,163

AVIKO G3 (Dry)

AVIKO ball scanner Dry is a exciting new generation development which we are introducing in 2023. Ball scanners are equipped with new PC/PLC touchscreen and whole HMI is improved. This upgrade brings us new possibilities like improved software statistics, protocols, sorting history, video manuals, direct connection to machine monitoring software Precision Viewer and many more. Mechanical settings of the machines is a lot easier thanks to automatic levers adjustment.

AVIKO G3 STANDARD

Aviko standard machines that range from 30mm to 100mm. These machines are designed with probes for crack detection, laser probe for surface defect detection and vibration probe for ovality detection. The core principle of ball rotation for 100% surface scanning is based on our control cylinders. More information can be found on the product data sheet for this ball scanner.



AVIKO G3 ADVANCED

AVIKO G3 ADVANCED is a cutting edge scanner for balls ranging from 30 to 100 mm. Opposed to our standard AVIKO G3 STANDARD, this version is equipped with **ibg** eddy-current probes, eddyvisor C crack-test unit and **Ai** evaluation application. Within the monitoring point the balls are scanned by four probes at one time (two eddy-current probes to capture surface and subsurface defects "temperline, grinderburns", opto-electrical probe to capture various surface defects and electro-vibration probe to capture large shape defects).

AVIKO TYPES	RANGE (mm)
AVIKO 3060 STANDARD (ADVANCED)	30 – 60
AVIKO 4080 STANDARD (ADVANCED)	40 – 80
AVIKO 60100 STANDARD (ADVANCED)	60 – 100

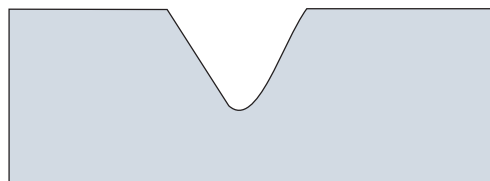
Other Services

- As part of the many services we provide, we offer annual certification and yearly maintenance for all machines we develop. Our certified technicians will calibrate and maintain the machine and issue calibration certification.
- Offer of commercial testing and sorting reports based on our technologies.
- Employee training is highly advised for new clients. Upon completion of the training, the operator will receive a certificate of completion. In case of interest, it is possible to order additional training for more employees or continued education.

Master Defects

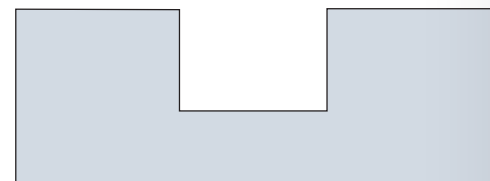
We offer master defects for various materials such as :conductive steel, ceramic and plastic balls. We provide defects using Laser or EDM technology (Electrical discharge machining - for steel materials only). Advantages of the laser defects are that they are reminiscent of natural defects and provides a stronger signal for eddy currents, which in the end guarantees stable repeatability. The pictures below illustrate the difference in the profile and tolerances of the individual defects.

Laser defect profile (V-Notch)



LENGTH	TOLERANCE
1500 µm	± 50 µm
750 µm	± 10 µm
WIDTH	TOLERANCE
50 µm	± 10 µm
DEPTH	TOLERANCE
50 µm	± 10 µm

EDM defect profile (Square Notch)

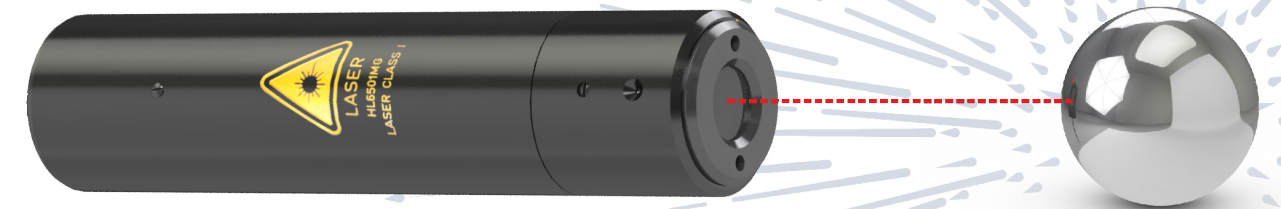


LENGTH	TOLERANCE
1500 µm	± 100 µm
750 µm	± 50 µm
WIDTH	TOLERANCE
50 µm	± 10 µm
DEPTH	TOLERANCE
50 µm	± 10 µm

Probes

Electro-Optical Probe

The electro-optical probe is designed to evaluate the surface quality. The probe is developed on the principle of the reflection of the laser beam from the surface of the ball with the ability to detect crack or spot defects. Balls must be of clean and dried for dry AVIKO scanning and only cleaned for wet AVIKO scanning prior to scanning. Up to 7 evaluation channels are used within the interface, which affect e.g. Absolute or average maximum and minimum allowed reflection. The frequency of the probe is 100,000 samples per second. The probes are supplied with master balls with each AVIKO ball scanner in order to verify the functionality of the probe and the machine settings.

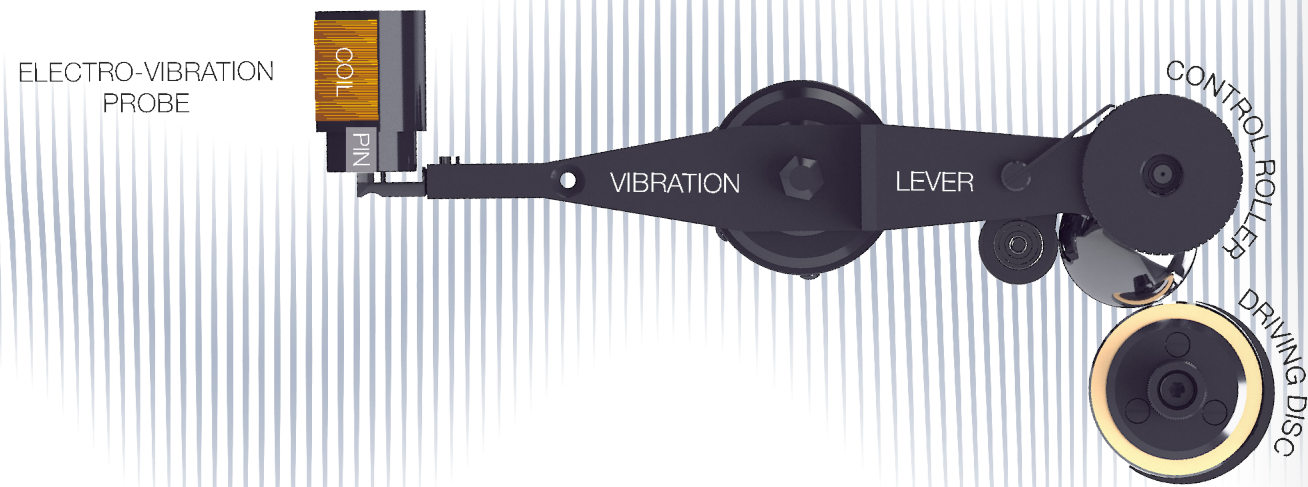


TECHNICAL SPECIFICATIONS		SCANNED AREA			
Frequency	100 kHz	AVIKO	DIAMETER (mm)	X (mm)	Y (mm)
Wave length	670±20 (nm)				
Output power	>1mW	0306	3.000 – 6.350	0.420 – 0.889	0.060 – 0.127
Resolution	1% of the reflected light drop	0610	5.556 – 10.319	0.661 – 1.228	0.066 – 0.123
Scanned area	See paragraph below	1014	10.000 – 14.000	1.190	0.119
Channels	7	1419	14.000 – 19.000	1.228	0.123
		1830	18.000 – 30.000	1.228	0.123

Probes

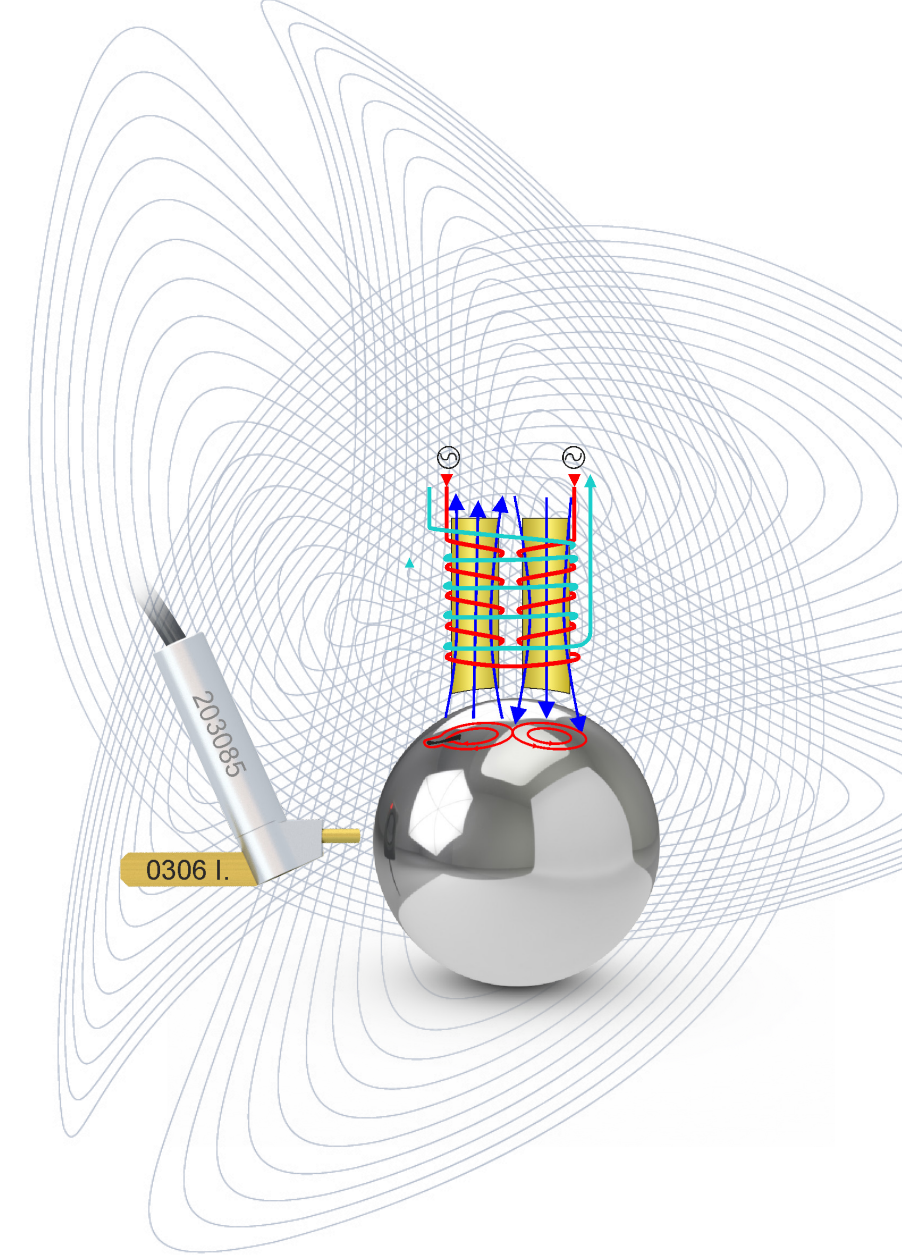
Electro-Vibration Probe

Large shape defects and missing material can interfere with the rotation of the sphere in the meridian pattern. For this reason, all AVIKO ball scanners have Electro-vibration probes installed. The probe is calibrated to eliminate defects in ovality greater than 70 µm. The sensitivity of the probe can be amplified within the software of the machine.



Eddy Current Probe

The eddy current probe is designed to eliminate balls with cracks, polished defects, impurities in the material and subsurface defects. Each AVIKO ball scanner is equipped with an oscilloscope to verify the signal of the ball. For ease of use the setup of the probe distance allows you to see the current distance without using a gauge. The constant distance of the probe from the surface of the ball has a fundamental effect on the signal strength, for this reason it is possible to activate distance monitoring with adjustable tolerances. For specific defects, you may adjust the phase selection so that a particular defect shows the maximum signal-noise ratio. The evaluation unit has two independent channels in order to set a different gain and phase selection. This creates the option to eliminate two different types of defects at the same time.



TECHNICAL SPECIFICATIONS

Type	Contactless
Gain	(-) 24 dB ... (+) 24 dB
Resistance	2
Precision	70 µm

Principle

Eddy current probes are differential with two active cores. It is possible to change the frequency directly in the machine software, which affects the depth of penetration into the material and the density of eddy currents. Standard ET probes are optimized for a medium transmission frequency of 400 kHz.

TECHNICAL SPECIFICATIONS

Trace width (0203)	0,6 mm
Trace width (0306)	1,2 mm
Trace width (>0610)	2,0 mm
Phase Selection	0 - 360°

4-Core ET probe

For AVIKO BALL SCANNERS designed for balls larger than 10 mm, it is possible to use an advanced 4-core probe, which can be used to detect defects such as grinder burns/temper lines.

Products

AVIKO G3 COMPACT (0203; 0306; 0610; 1014; 1419; 1830)

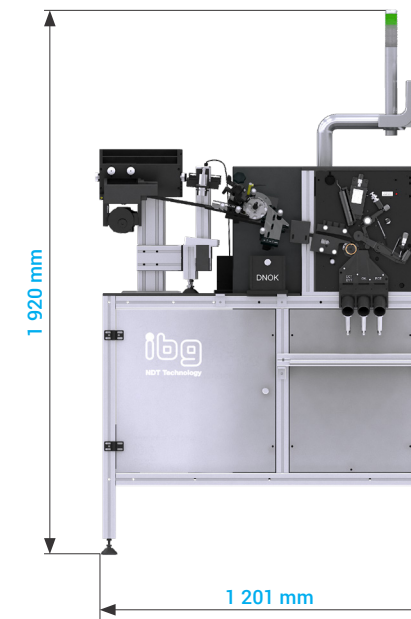
Aviko standard machines that range from 2mm to 30mm. These machines are designed with probes for crack detection, laser sensor for surface defect detection and vibration sensor for ovality detection. The core principle of ball rotation for 100% surface scanning is based on control rollers.



*Illustration represents
AVIKO 1830 G3 COMPACT

ORDER INFORMATION

MODEL	SORTING DIAMETER (mm)	ORDER NUMBER
AVIKO 0203 G3 COMPACT	1,984 - 3,175	K 097 400
AVIKO 0306 G3 COMPACT	2,778 - 6,350	K 097 450
AVIKO 0610 G3 COMPACT	5,556 - 10,319	K 097 500
AVIKO 1014 G3 COMPACT	9,500 - 14,286	K 097 550
AVIKO 1419 G3 COMPACT	13,494 - 19,050	K 097 700
AVIKO 1830 G3 COMPACT	18,000 - 30,163	K 097 750



Structure

AVIKO G3 COMPACT may be upgraded with a additional scan for the micro-structure. The micro-structure scan is capable to sort out the balls with different material as well as different hardness. Due to the eddy-current technology used, only ferromagnetic steels can be sorted out with this test. An eddyvisor S unit and eddy current probe from ibg Prüfcomputer GmbH are used for testing.



Scan Speed

Machine	Min. Ball Ø		Max. Ball Ø		Min. Ø Scan Speed		Max. Ø Scan Speed	
	[mm]	[inch]	[mm]	[inch]	Standard [pcs/hr]	Aerospace [pcs/hr]	Standard [pcs/hr]	Aerospace [pcs/hr]
AVIKO 0203 G3 COMPACT	1.984	5/64	3.175	1/8	34 100	32 100	30 500	28 100
AVIKO 0306 G3 COMPACT	2.778	7/64	6.350	1/4	32 800	30 500	24 500	21 600
AVIKO 0610 G3 COMPACT	5.556	7/32	10.319	13/32	26 200	19 000	17 600	11 900
AVIKO 1014 G3 COMPACT	9.525	3/8	14.286	-	18 800	16 700	11 600	9 300
AVIKO 1419 G3 COMPACT	13.494	17/32	19.050	3/4	12 800	10 600	7 900	6 700
AVIKO 1830 G3 COMPACT	18.000	-	30.163	1-3/16	7 700	6 600	3 500	2 800

* Scan speed is calculated for both sides working in unison. (Same diameter)

	AVIKO 0203 COMPACT	AVIKO 0306 - 1419 COMPACT	AVIKO 1830 COMPACT
Dimensions (LxWxH)	1000 x 1201 x 1920		
Weight	170 (kg)	170 (kg)	200 (kg)
Sorting groups	3 (OK, EOT probe rejection; EVT/ECT probe rejection)		
Input Power (230V)	230V, 50Hz/60Hz (E plug)		
Input Power (110V)	110V, 50Hz/60Hz (B plug)		

	SCAN AREA width	MAX. DEFECT size
Electric optical probe	1.2 mm	Spot defect Ø 600 µm
Electric vibration probe	-	Deep flat 700 µm
Eddy current probes	2 mm	Crack defect 750 x 50 x 50 (µm)

Products

AVIKO G3 STANDARD (3060; 4080; 60100)

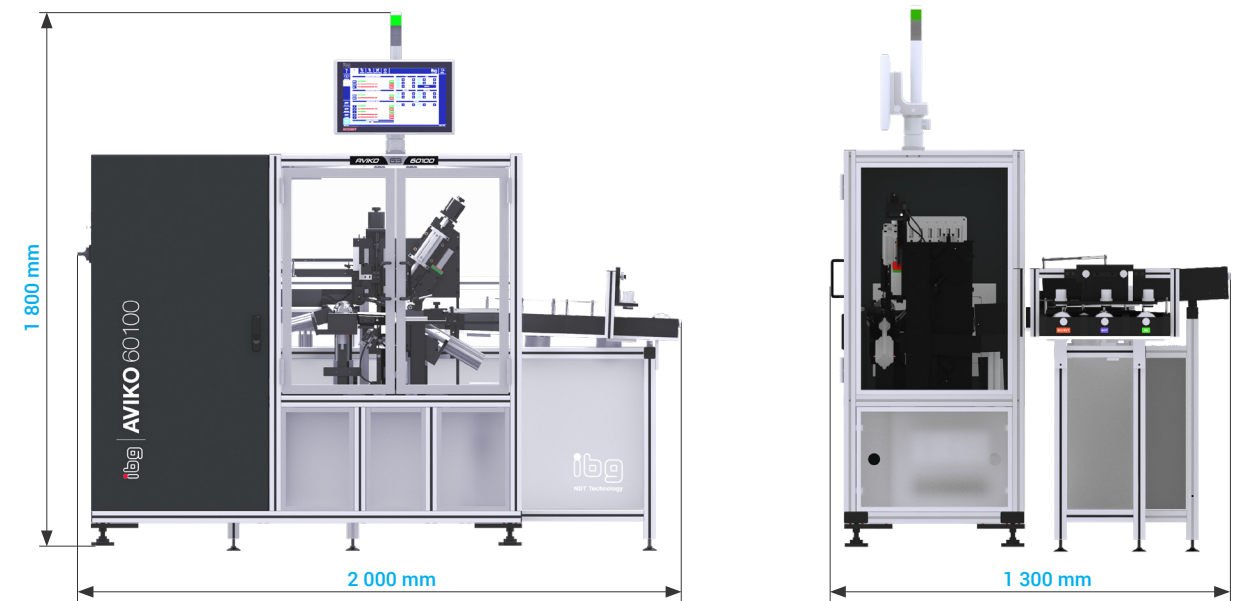
Aviko standard machines that range from 30mm to 100mm. These machines are designed with probes for crack detection, laser sensor for surface defect detection and vibration sensor for ovality detection. The core principle of ball rotation for 100% surface scanning is based on control cylinders. Loader and outlet holder are included with this machine.



*Illustration represents
AVIKO 60100 G3 STANDARD

ORDER INFORMATION

MODEL	SORTING DIAMETER (mm)	ORDER NUMBER
AVIKO 3060 G3 STANDARD - ELECTRIC	30 - 60	K 096 600E
AVIKO 4080 G3 STANDARD - ELECTRIC	40 - 80	K 096 700E
AVIKO 60100 G3 STANDARD - ELECTRIC	60 - 100	K 096 800E
AVIKO 3060 G3 STANDARD - COMPRESSED AIR	30 - 60	K 096 000
AVIKO 4080 G3 STANDARD - COMPRESSED AIR	40 - 80	K 096 200
AVIKO 60100 G3 STANDARD - COMPRESSED AIR	60 - 100	K 096 400



Compressed air

All primary movement elements are driven by compressed air.

Electric

All primary movement elements are driven by electric motors.

Scan Speed

AVIKO 3060		AVIKO 4080		AVIKO 60100	
BALL Ø [mm]	SCAN SPEED [pcs/hr]	BALL Ø [mm]	SCAN SPEED [pcs/hr]	BALL Ø [mm]	SCAN SPEED [pcs/hr]
30	237	40	188	60	117
40	188	50	148	70	94
50	148	60	117	80	86
60	117	70	94	90	72
		80	86	100	61

* Scan speed is calculated for meridian width 0.9 mm

AVIKO G3 (3060; 4080; 60100)

Dimensions (LxWxH)	1 300 x 2 000 x 1 800 (mm)
Weight	355 kg
Sorting groups	3 (OK, EOT probe rejection; EVT/ECT probe rejection)
Input Power (230V)	230V, 50Hz/60Hz (E plug)
Input Power (110V)	110V, 50Hz/60Hz (B plug)

	SCAN AREA width	MAX. DEFECT size
Electric optical probe	1.2 mm	Spot defect Ø 600 µm
Electric vibration probe	-	Deep flat 700 µm
Eddy current probes	2 mm	Crack defect 750 x 50 x 50 (µm)

Products

AVIKO G3 ADVANCED (3060; 4080; 60100)

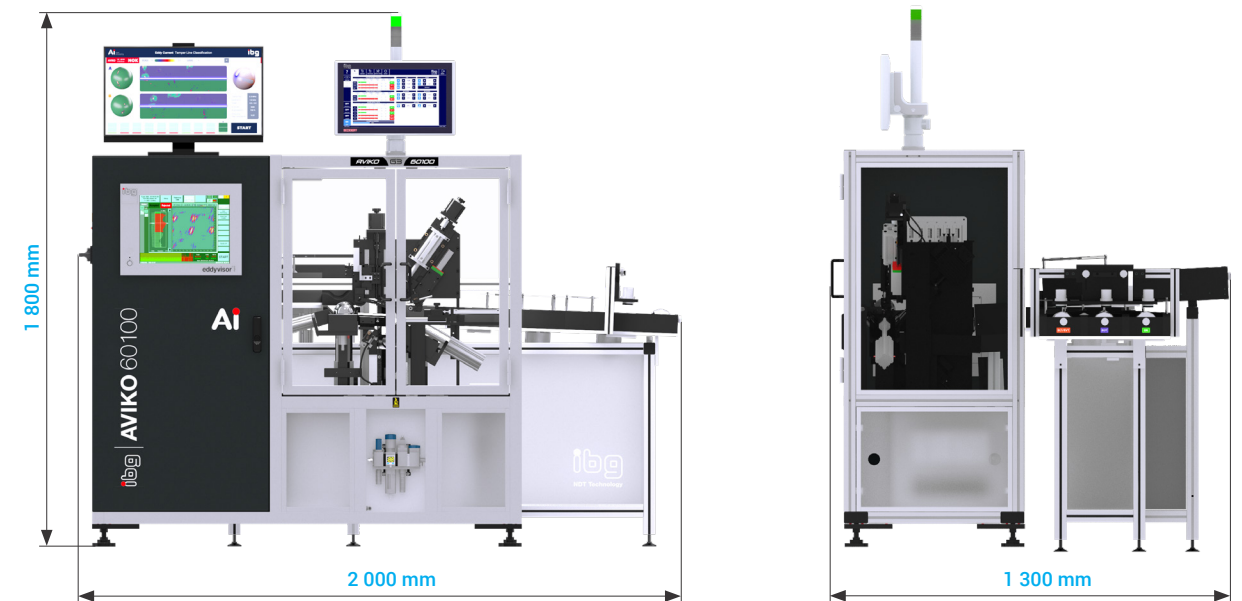
AVIKO G3 ADVANCED is a cutting edge scanner for balls ranging from 30 to 100 mm. Opposed to our standard AVIKO G3 STANDARD, this version is equipped with ibg eddy-current probes, eddyvisor C crack-test unit and Ai evaluation application. Loader and outlet holder is included with this machine.



*Illustration represents
AVIKO 60100 G3 ADVANCED

ORDER INFORMATION

MODEL	SORTING DIAMETER (mm)	ORDER NUMBER
AVIKO 3060 G3 STANDARD - ELECTRIC	30 - 60	K 096 600AE
AVIKO 4080 G3 STANDARD - ELECTRIC	40 - 80	K 096 700AE
AVIKO 60100 G3 STANDARD - ELECTRIC	60 - 100	K 096 800AE
AVIKO 3060 G3 STANDARD - COMPRESSED AIR	30 - 60	K 096 000A
AVIKO 4080 G3 STANDARD - COMPRESSED AIR	40 - 80	K 096 200A
AVIKO 60100 G3 STANDARD - COMPRESSED AIR	60 - 100	K 096 400A



Compressed air

All primary movement elements are driven by compressed air.

Electric

All primary movement elements are driven by electric motors.

Scan Speed

AVIKO 3060		AVIKO 4080		AVIKO 60100	
BALL Ø [mm]	SCAN SPEED [pcs/hr]	BALL Ø [mm]	SCAN SPEED [pcs/hr]	BALL Ø [mm]	SCAN SPEED [pcs/hr]
30	237	40	188	60	117
40	188	50	148	70	94
50	148	60	117	80	86
60	117	70	94	90	72
		80	86	100	61

* Scan speed is calculated for meridian width 0.9 mm

AVIKO G3 (3060; 4080; 60100)

Dimensions (LxWxH)	1 300 x 2 000 x 1 800 (mm)
Weight	355 kg
Sorting groups	3 (OK, EOT probe rejection; EVT/ECT probe rejection)

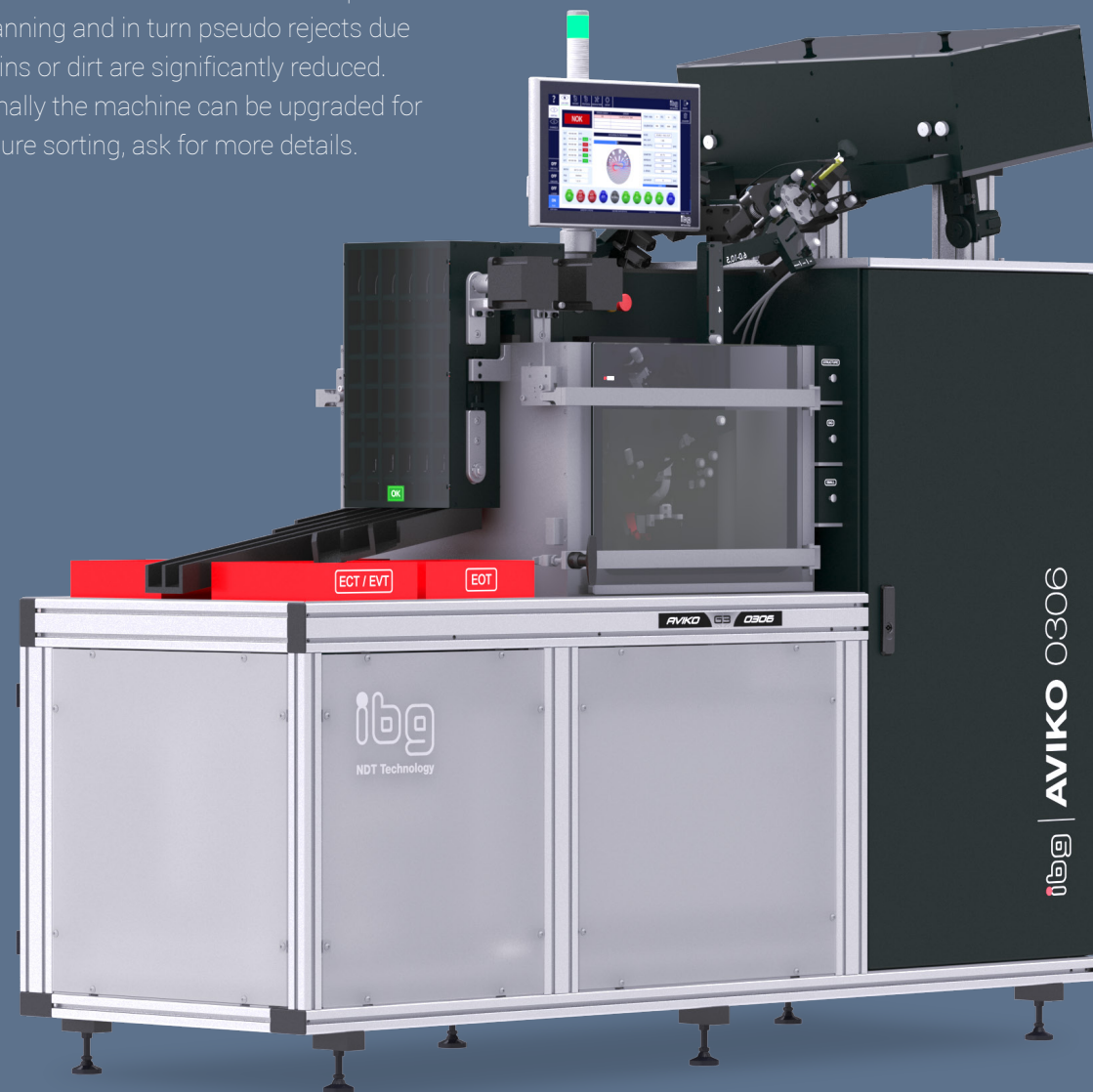
Input Power (230V)	230V, 50Hz/60Hz (E plug)
Input Power (110V)	110V, 50Hz/60Hz (B plug)

	SCAN AREA width	MAX. DEFECT size
Electric optical probe	1.2 mm	Spot defect Ø 600 µm
Electric vibration probe	-	Deep flat 700 µm
Eddy current probes	2 mm	Temperline and grinder burn

Products

AVIKO G3 WET STEEL (0306; 0610; 1014; 1419; 1830)

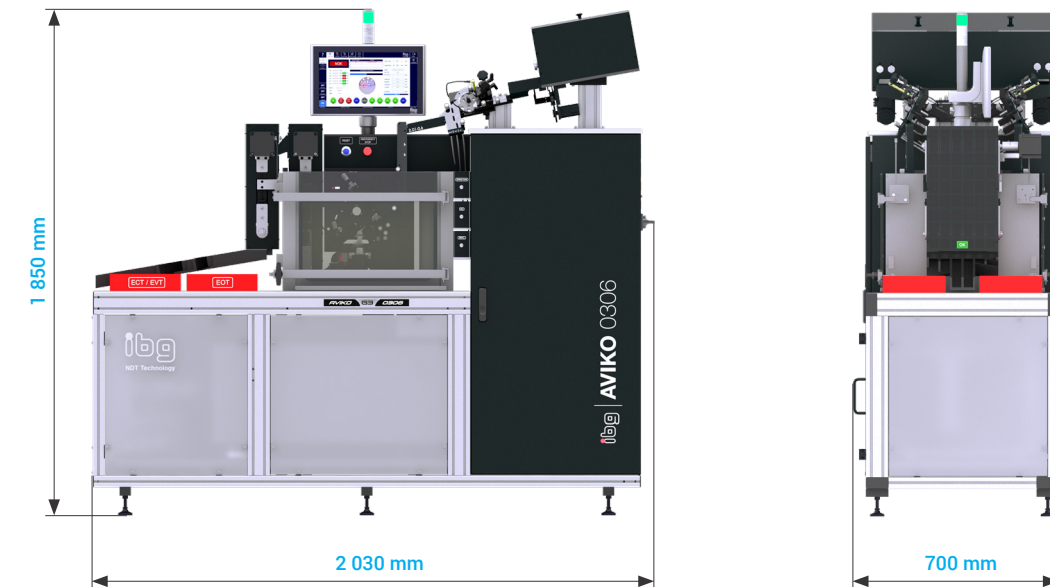
This type of ball scanner performs the scan within an oil-based solution. Noise-vibration reduction within the wet environment ensures a more precise and reliable inspection. One of many exciting features is that the balls do not have to be dried prior to scanning and in turn pseudo rejects due to stains or dirt are significantly reduced. Optionally the machine can be upgraded for structure sorting, ask for more details.



*Illustration represents
AVIKO 0306 G3 WET STEEL

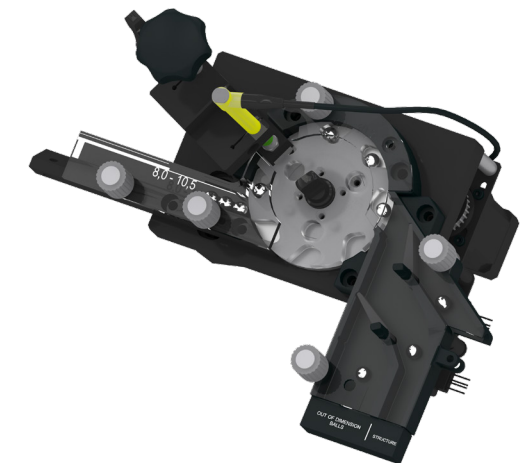
ORDER INFORMATION

MODEL	SORTING DIAMETER (mm)	ORDER NUMBER
AVIKO 0306 G3 WET - STEEL	2.778 – 6.350	K 092 000
AVIKO 0610 G3 WET - STEEL	5.556 – 10.319	K 092 200
AVIKO 1014 G3 WET - STEEL	9.500 – 14.286	K 092 400
AVIKO 1419 G3 WET - STEEL	13.494 – 19.050	K 092 600
AVIKO 1830 G3 WET - STEEL	18.000 – 30.163	K 092 800



Diameter and Structure Sorter

As part of the upgrade of our new generation AVIKO G3 machines we have implemented a brand new diameter validation solution which is much more precise with ability to exclude the balls which are $\pm 1 \mu\text{m}$ out of the selected ball diameter. Optionally the sorter can be upgraded with a structure probe to reject the balls with different structure than calibrated. The balls are rejected prior to the monitoring point scanning which prevents additional wear and tear of the machine parts with NOK balls.



Scan Speed

Machine	Min. Ball Ø		Max. Ball Ø		Min. Ø Scan Speed		Max. Ø Scan Speed	
	[mm]	[inch]	[mm]	[inch]	Standard [pcs/hr]	Aerospace [pcs/hr]	Standard [pcs/hr]	Aerospace [pcs/hr]
AVIKO 0306 G3 WET	2.778	7/64	6.350	1/4	15 600	13 800	20 600	19 200
AVIKO 0610 G3 WET	5.556	7/32	10.319	13/32	13 100	8 500	20 100	13 900
AVIKO 1014 G3 WET	9.525	3/8	14.600	-	8 400	6 600	14 200	12 300
AVIKO 1419 G3 WET	13.494	17/32	19.050	3/4	5 600	4 700	9 300	7 700
AVIKO 1830 G3 WET	18.000	-	30.163	1-3/16	2 500	2 000	5 600	4 300

* Scan speed is calculated for both sides working in unison. (same diameter)

AVIKO G3 WET STEEL (0306; 0610; 1014; 1419; 1830)

Dimensions (LxWxH)	2 030 × 700 × 1 850 (mm)
Weight	400 kg
Sorting groups	3 (OK, EOT probe rejection; EVT/ECT probe rejection)

Input Power (230V)	230V, 50Hz/60Hz (E plug)
Input Power (110V)	110V, 50Hz/60Hz (B plug)

	SCAN AREA width	MAX. DEFECT size
Electric optical probe	1.2 mm	Spot defect Ø 600 μm
Electric vibration probe	-	Deep flat 700 μm
Eddy current probes	2 mm	Crack defect 750 × 50 × 50 (μm)

Products

AVIKO G3 WET CERAMIC (0306; 0610; 1014; 1419; 1830)

AVIKO WET ceramic ball scanner is one sided machine where the scanning is performed by enhanced electro-optical probe, sub-surface eddy-current probe and specially designed electro-vibration probe. All probes are evaluated by the eddyvisor evaluation unit and sorted based on **Ai** evaluation.

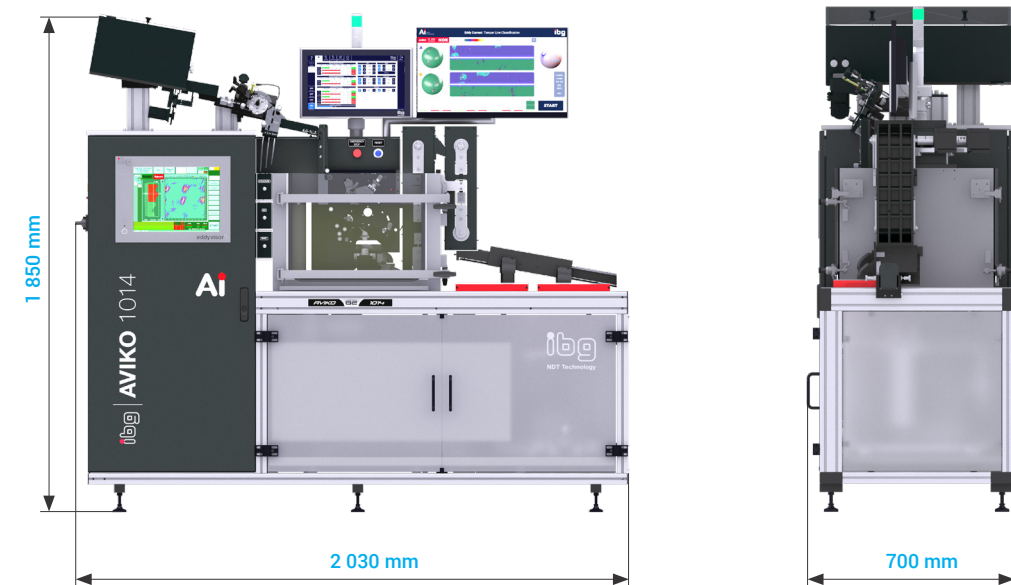


*Illustration represents
AVIKO 1014 G3 WET CERAMIC

ORDER INFORMATION

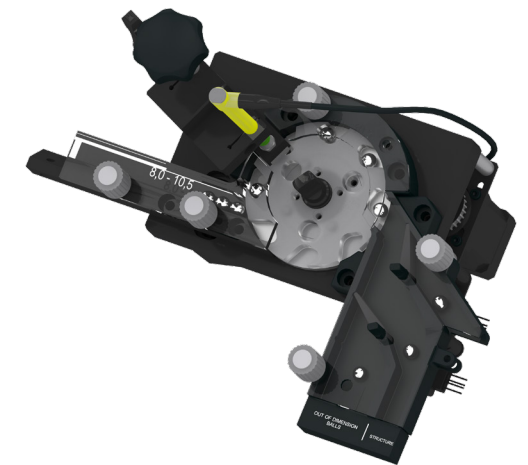
MODEL	SORTING DIAMETER (mm)	ORDER NUMBER
AVIKO 0306 G3 WET - CERAMIC	2.778 – 6.350	K 092 000C
AVIKO 0610 G3 WET - CERAMIC	5.556 – 10.319	K 092 200C
AVIKO 1014 G3 WET - CERAMIC	9.500 – 14.286	K 092 400C
AVIKO 1419 G3 WET - CERAMIC	13.494 – 19.050	K 092 600C
AVIKO 1830 G3 WET - CERAMIC	18.000 – 30.163	K 092 800C

*Availability as of second half of 2023



Diameter and Structure Sorter

As part of the upgrade of our new generation AVIKO G3 machines we have implemented a brand new diameter validation solution which is much more precise with ability to exclude the balls which are $\pm 1 \mu\text{m}$ out of the selected ball diameter. Optionally the sorter can be upgraded with a structure probe to reject the balls with different structure than calibrated. The balls are rejected prior to the monitoring point scanning which prevents additional wear and tear of the machine parts with NOK balls.



Scan Speed

Machine	Min. Ball Ø		Max. Ball Ø		Min. Ø Scan Speed		Max. Ø Scan Speed	
	[mm]	[inch]	[mm]	[inch]	Standard [pcs/hr]	Aerospace [pcs/hr]	Standard [pcs/hr]	Aerospace [pcs/hr]
AVIKO 0306 G3 WET	2.778	7/64	6.350	1/4	7 800	6 900	10 300	9 600
AVIKO 0610 G3 WET	5.556	7/32	10.319	13/32	6 550	4 250	10 050	6 950
AVIKO 1014 G3 WET	9.525	3/8	14.600	-	4 200	3 300	7 100	6 150
AVIKO 1419 G3 WET	13.494	17/32	19.050	3/4	2 800	2 350	4 650	3 850
AVIKO 1830 G3 WET	18.000	-	30.163	1-3/16	1 250	1 000	2 800	2 150

AVIKO G3 WET CERAMIC (0306; 0610; 1014; 1419; 1830)

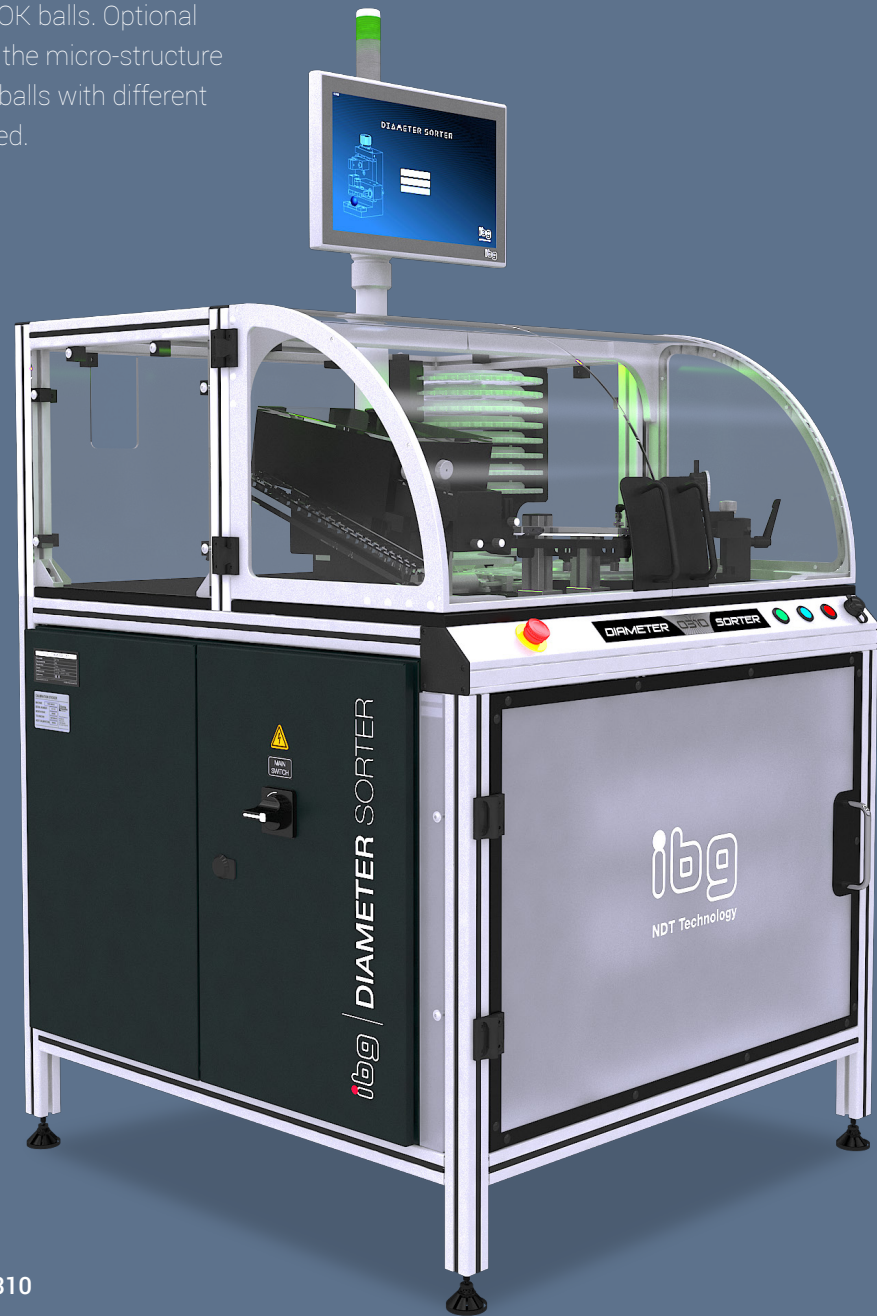
Dimensions (LxWxH)	2 030 × 700 × 1 850 (mm)
Weight	410 kg
Sorting groups	3 (OK, EOT probe rejection; EVT/ECT probe rejection)
Input Power (230V)	230V, 50Hz/60Hz (E plug)
Input Power (110V)	110V, 50Hz/60Hz (B plug)

	SCAN AREA width	MAX. DEFECT size
Electric optical probe	1.2 mm	Spot defect Ø 600 μm
Electric vibration probe	-	Deep flat 700 μm
Eddy current probes	2 mm	Metal inclusions

Products

DIAMETER SORTER (0310; 0820)

Diameter sorter is machine used to sort balls by diameter of the ball, which is done by LVDT probe measurement with remarkable repeatability of $\pm 0.15 \mu\text{m}$. The balls are sorted to 8 groups where one of them is reserved for NOK balls. Optional upgrade to implement the micro-structure testing probe to reject balls with different structure than calibrated.



*Illustration represents
DIAMETER SORTER 0310

ORDER INFORMATION

MODEL	SORTING DIAMETER (mm)	ORDER NUMBER	ORDER NUMBER (+ STRUCTURE)
DIAMETER SORTER 0310	3.000 – 10.319	K 083 700A	K 083 700 C
DIAMETER SORTER 0820	8.000 – 20.000	K 083 800A	K 083 800C



Diameter

The ball diameter is measured by a high-precision LVDT probe with accuracy of up to ± 0.15 micron.

Structure

Diameter sorter may be upgraded with a additional scan for the micro-structure. The micro-structure scan is capable to sort out the balls with different material as well as different hardness. Due to the eddy-current technology used, only ferromagnetic steels can be sorted out with this test. An eddyguard S unit and eddy current probe from ibg Prüfcomputer GmbH are used for testing.

Scan Speed

Machine	Min. Ball \varnothing [mm]	Max. Ball \varnothing [mm]	Min. \varnothing Scan Speed [pcs/hr]	Max. \varnothing Scan Speed [pcs/hr]
DIAMETER SORTER 0310	3.000	10.000	13 000	12 000
DIAMETER SORTER 0820	8.000	20.000	4 000	3 000

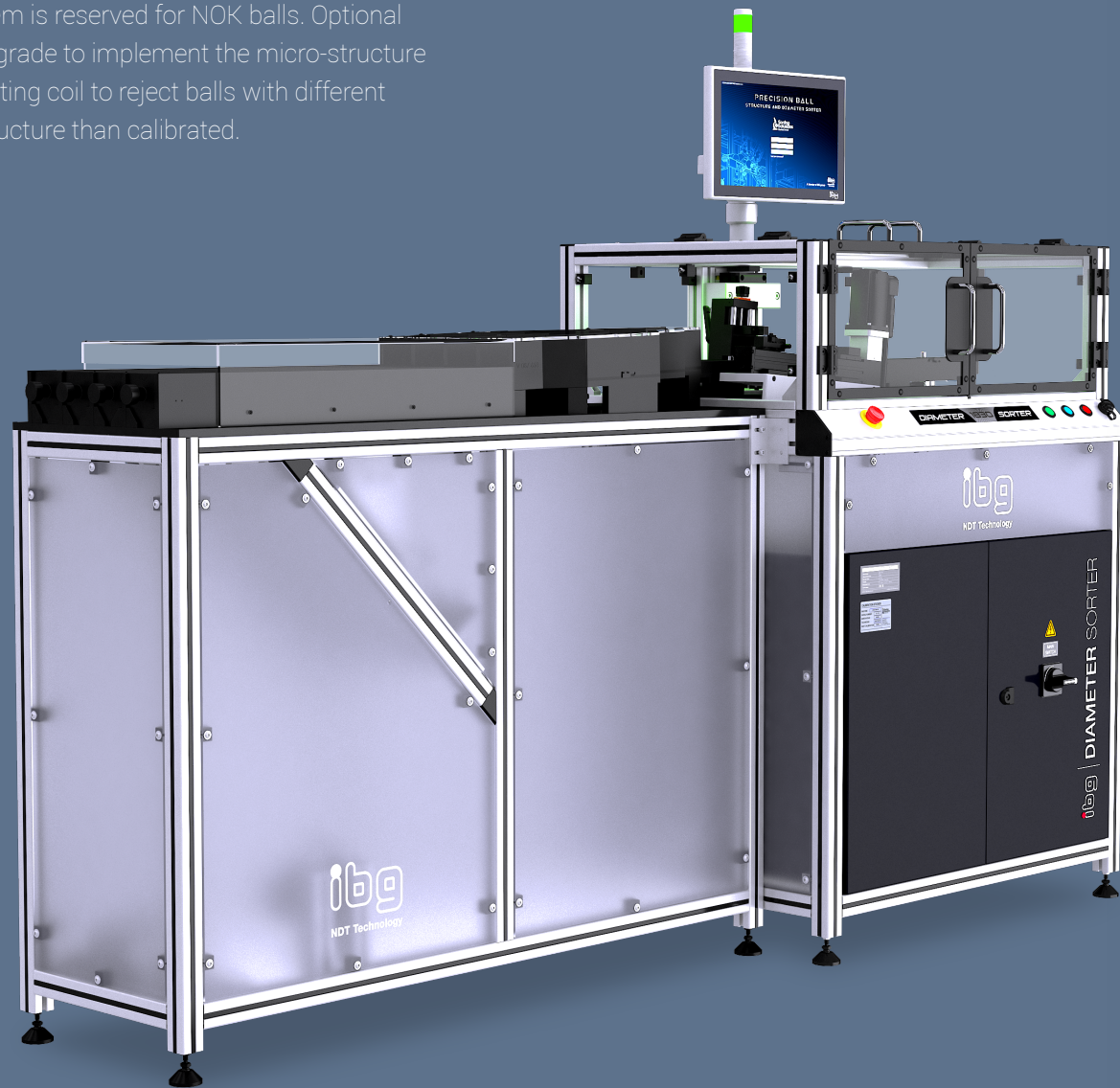
DIAMETER SORTER (0310; 0820)

Dimensions (LxWxH)	970 x 980 x 1 630 (mm)
Weight	282 kg
Sorting groups	7 + NOK
Repeatability	$\pm 0.15 \mu\text{m}$
Input Power (230V)	230V, 50Hz/60Hz (E plug)
Input Power (110V)	110V, 50Hz/60Hz (B plug)

Products

DIAMETER SORTER (1830; 3060; 4080; 60100)

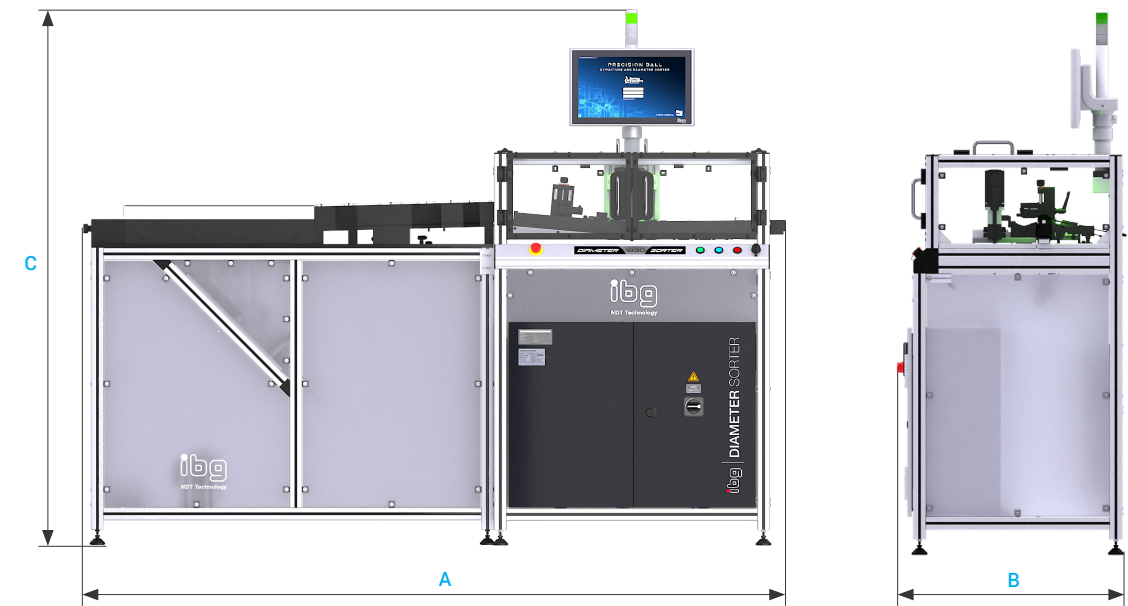
Diameter sorter is machine used to sort balls by diameter of the ball, which is done by LVDT probe measurement with remarkable repeatability of $\pm 0.15 \mu\text{m}$. The balls are sorted to 4 groups where one of them is reserved for NOK balls. Optional upgrade to implement the micro-structure testing coil to reject balls with different structure than calibrated.



*Illustration represents
DIAMETER SORTER 1830

ORDER INFORMATION

MODEL	SORTING DIAMETER (mm)	ORDER NUMBER	ORDER NUMBER (+ STRUCTURE)
DIAMETER SORTER 1830	18.000 – 30.000	K 087 002A	K 087 002C
DIAMETER SORTER 3060	30.000 – 60.000	K 087 004	K 087 003B
DIAMETER SORTER 4080	40.000 – 80.000	K 087 003	K 087 004B
DIAMETER SORTER 60100	60.000 – 100.000	K 087 005	K 087 005B



Diameter

The ball diameter is measured by a high-precision LVDT probe with accuracy of up to ± 0.15 micron.

Structure

Diameter sorter may be upgraded with a additional scan for the micro-structure. The micro-structure scan is capable to sort out the balls with different material as well as different hardness. Due to the eddy-current technology used, only ferromagnetic steels can be sorted out with this test. An eddyguard S unit and eddy current coil from ibg Prüfcomputer GmbH are used for testing.

Scan Speed

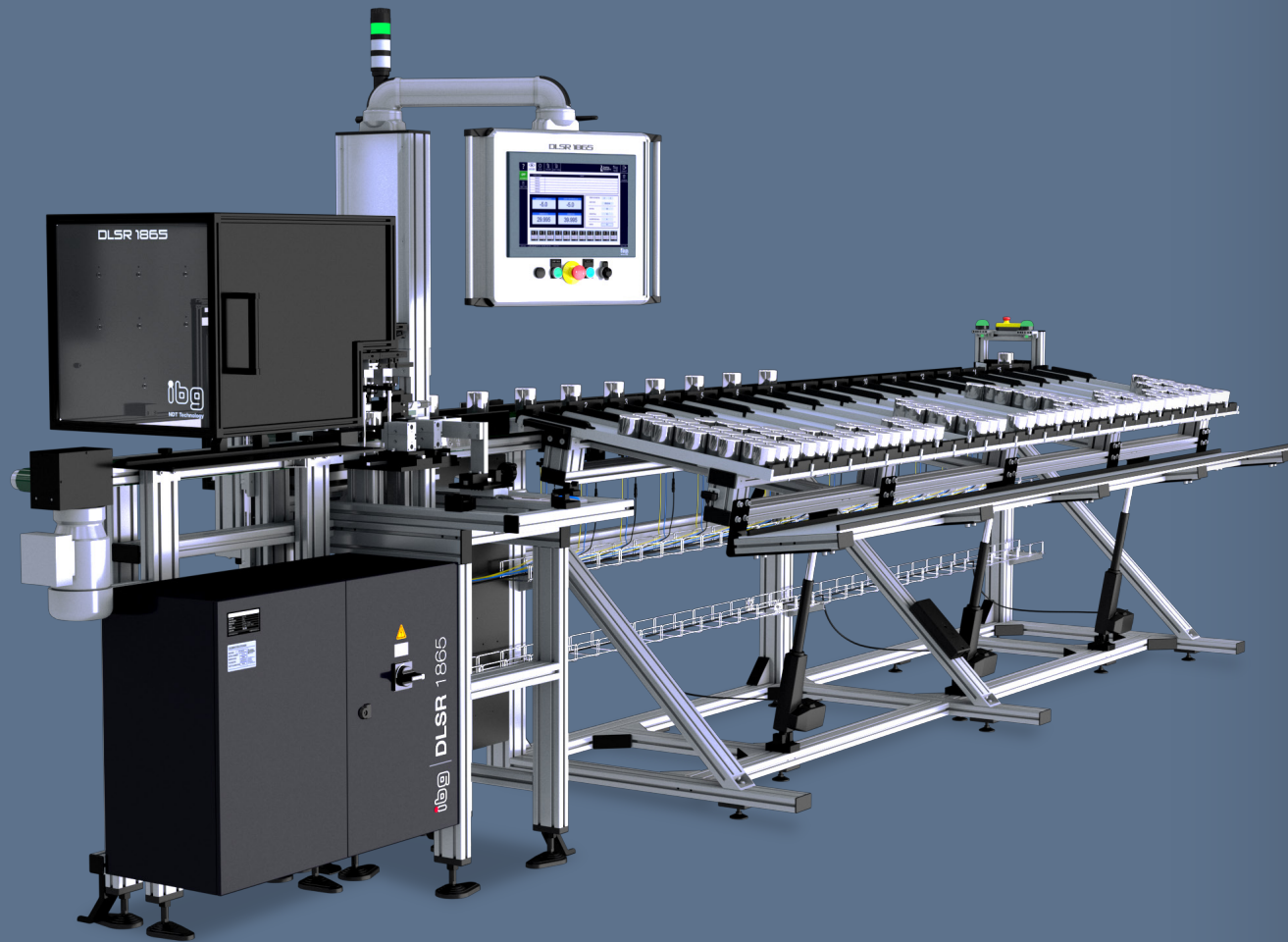
Machine	Min. Ball Ø [mm]	Max. Ball Ø [mm]	Min. Ø Scan Speed [pcs/hr]	Max. Ø Scan Speed [pcs/hr]
DIAMETER SORTER 1830	18.000	30.000	3 000	2 800
DIAMETER SORTER 3060	30.000	60.000	2 800	1 800
DIAMETER SORTER 4080	40.000	80.000	2 400	1 300
DIAMETER SORTER 60100	60.000	100.000	1 800	800

	DIAMETER SORTER 1830	DIAMETER SORTER 3060
Dimensions (AxBxC)	1 656 x 692 x 1 643 (mm)	2 312 x 692 x 1 643 (mm)
Weight	282 kg	295 kg
Sorting groups	7 + NOK	3 + NOK
Repeatability	$\pm 0.15 \mu\text{m}$	$\pm 0.15 \mu\text{m}$
Input Power (230V)	230V, 50Hz/60Hz (E plug)	
Input Power (110V)	110V, 50Hz/60Hz (B plug)	

Products

DIAMETER & LENGTH SORTER 1865

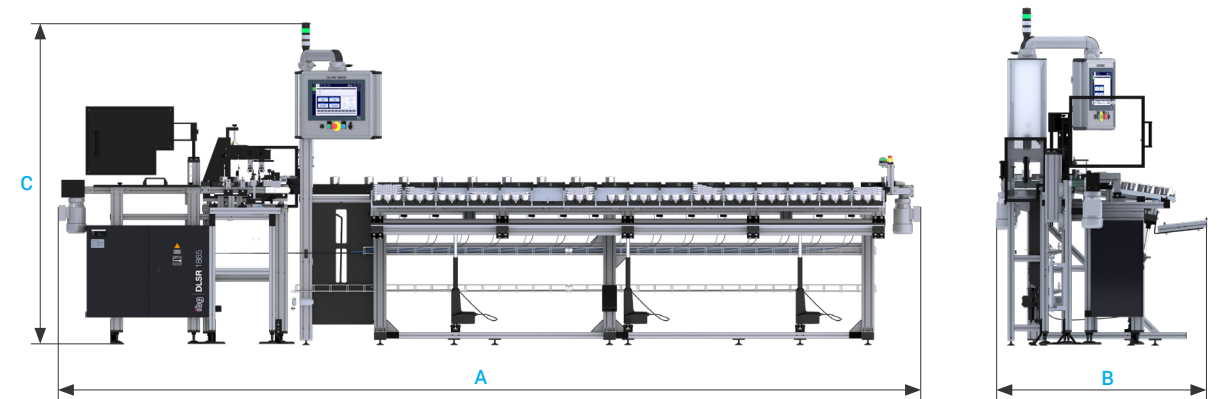
DLSR 1865 is a automatic sorting machine for the measurement of the diameter and length of steel cylindrical and tapered rollers. The parts are transported to the measuring point by means of an input conveyor. At the measuring point, the part type surfaces are scanned using high precision two LVDT probes at the same time - first probe is designed to scan the length and second probe is designed to scan the diameter. Once the scan is completed the part types are sorted 16 groups. The machine is designed for dimensional inspection of cylindrical and tapered rollers in the nominal range from 20 to 65 mm in diameter and from 20 to 95 mm in length.



*Illustration represents
DIAMETER & LENGTH SORTER 1865

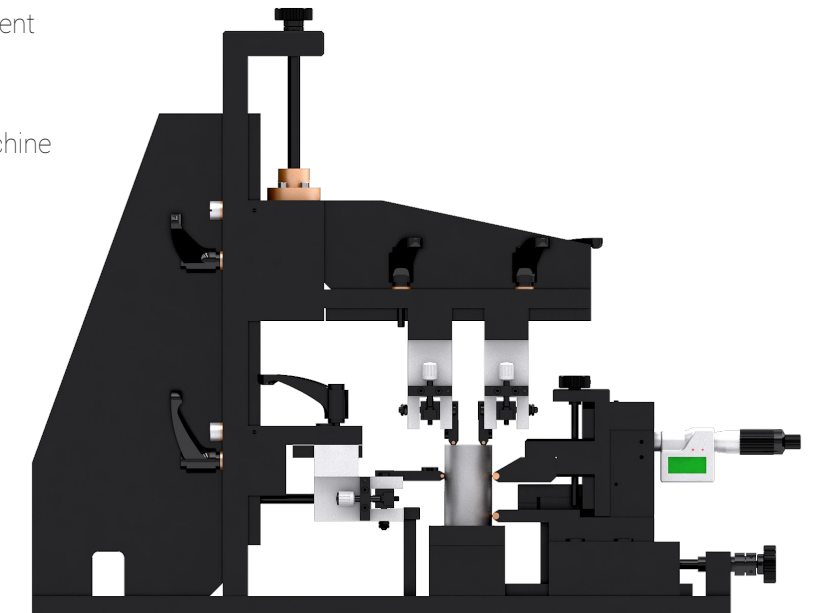
ORDER INFORMATION

MODEL	ROLLER DIAMETER (mm)	ROLLER LENGTH (mm)	ORDER NUMBER
DLSR 1865 STANDARD	20.000 – 65.000	20.000 – 95.000	K 088 000
DLSR 1865 + CRACK REJECTION	20.000 – 65.000	20.000 – 95.000	K 088 400
DLSR 1865 + STRUCTURE TEST	20.000 – 65.000	20.000 – 95.000	K 088 600
DLSR 1865 + CRACK & STRUCTURE	20.000 – 65.000	20.000 – 95.000	K 088 800



Options

- 2nd probe for length measurement
- 32 outlet holders
- Inlet Loader
- Crack and structure testing machine
- Laser marking



Technical Specification

DIAMETER & LENGTH SORTER 1865	
Dimensions 16 groups (A×B×C)	5 620 × 1 300 × 2 100 (mm)
Dimensions 32 groups (A×B×C)	5 620 × 2 210 × 2 100 (mm)
Weight 32 groups	820 kg
Repeatability	± 0.15 µm
LVDT probe linearity error	0.8% FS (full-scale) ± 250 µm range (at 20 °C ± 1°C)
Compressed Air	5-10 [BAR]; 72,5 - 145 [PSI]
Scan speed	1 850 pcs/hr
Tapered roller max. apex angle	9°
Input Power (230V)	230V, 50Hz/60Hz (E plug)
Input Power (110V)	110V, 50Hz/60Hz (B plug)

*Before ordering contact us to discuss the rollers specifications

Products

INLINE GAUGING EXCAVATOR

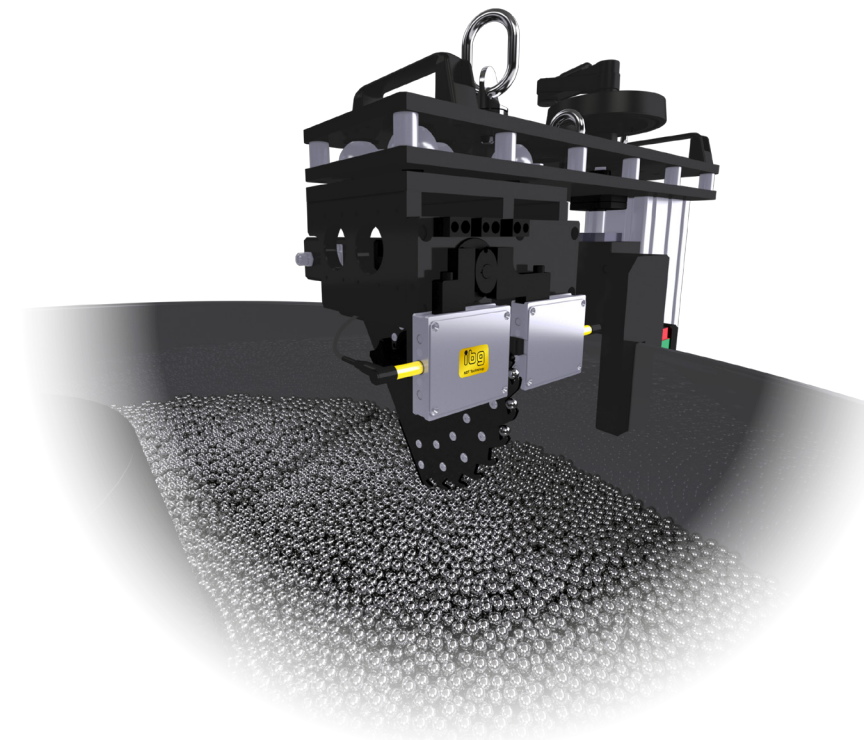
Inline Gauging Excavator is intended for Standard ball gauging during the ball production processes. The machine is capable to measure the balls in the range of 4.5 - 9.5 mm and can be used as standalone or be enhanced to communicate with the production machine PLC. We are offering the IGE in manual (Std) or fully automatic version (Advanced), where the excavator wheel depth is automatically set with the ball level sensors.



*Illustration represents
INLINE GAUGING EXCAVATOR

ORDER INFORMATION

MODEL	BALL DIAMETER (mm)	ORDER NUMBER
INLINE GAUGING EXCAVATOR STD	4.500 – 9.500	K 102 000
INLINE GAUGING EXCAVATOR ADVANCED	4.500 – 9.500	K 102 200



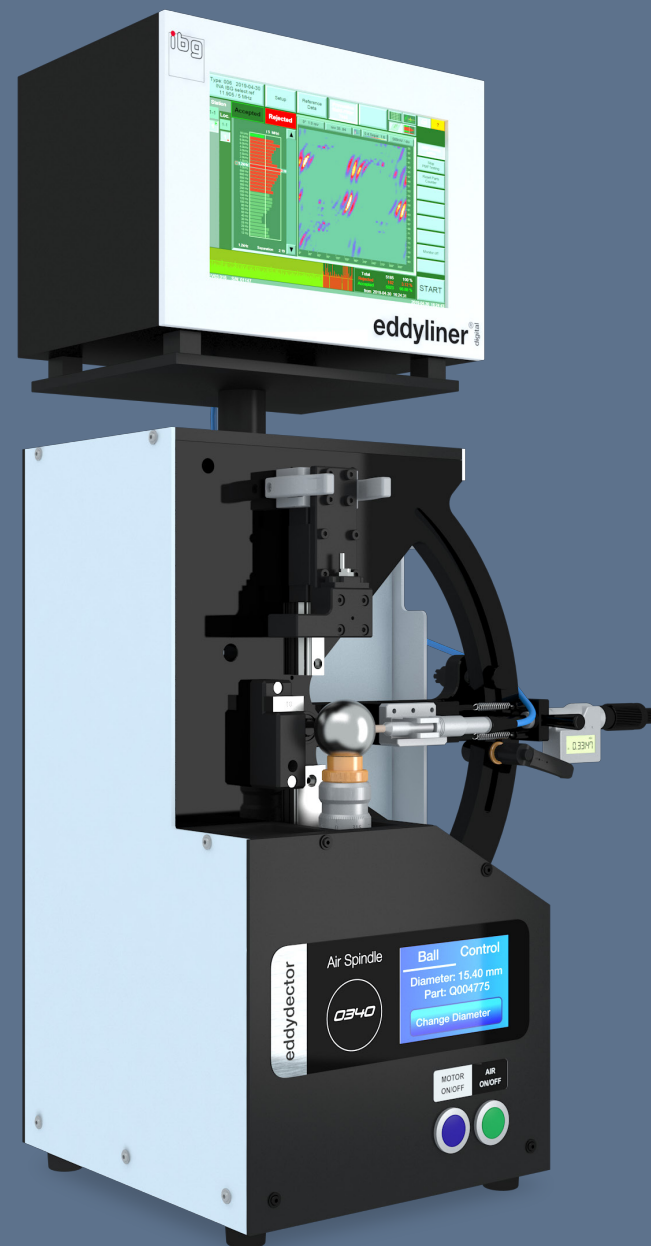
Technical Specification

INLINE GAUGING EXCAVATOR	
Dimensions (LxWxH)	650 x 960 x 1 130 (mm)
Weight	170 kg
Repeatability	± 0.15 µm
LVDT probe linearity error	0.8% FS (full-scale) ± 250 µm range (at 20 °C ± 1°C)
Input Power (230V)	230V, 50Hz/60Hz (E plug)
Input Power (110V)	110V, 50Hz/60Hz (B plug)

Products

EDDYDECTOR AIR SPINDLE (0340; 40100)

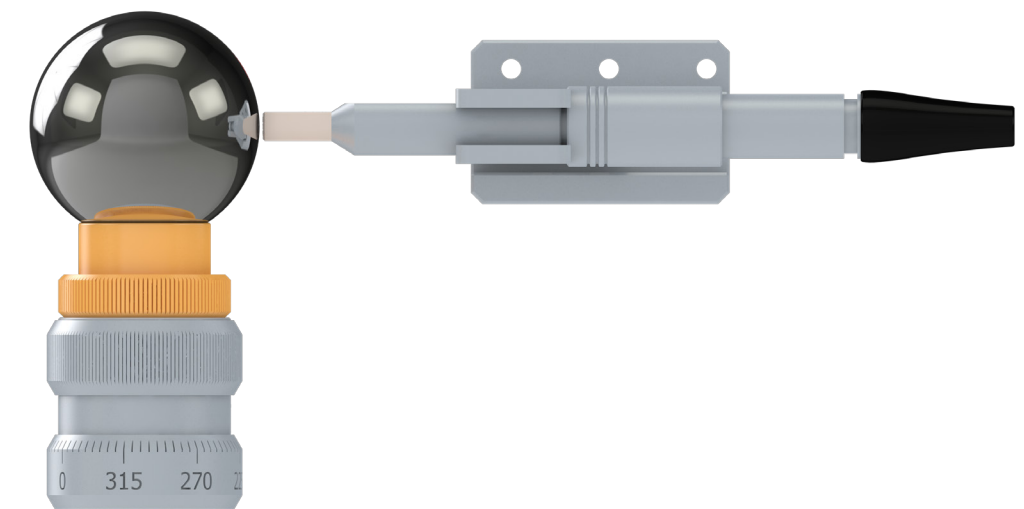
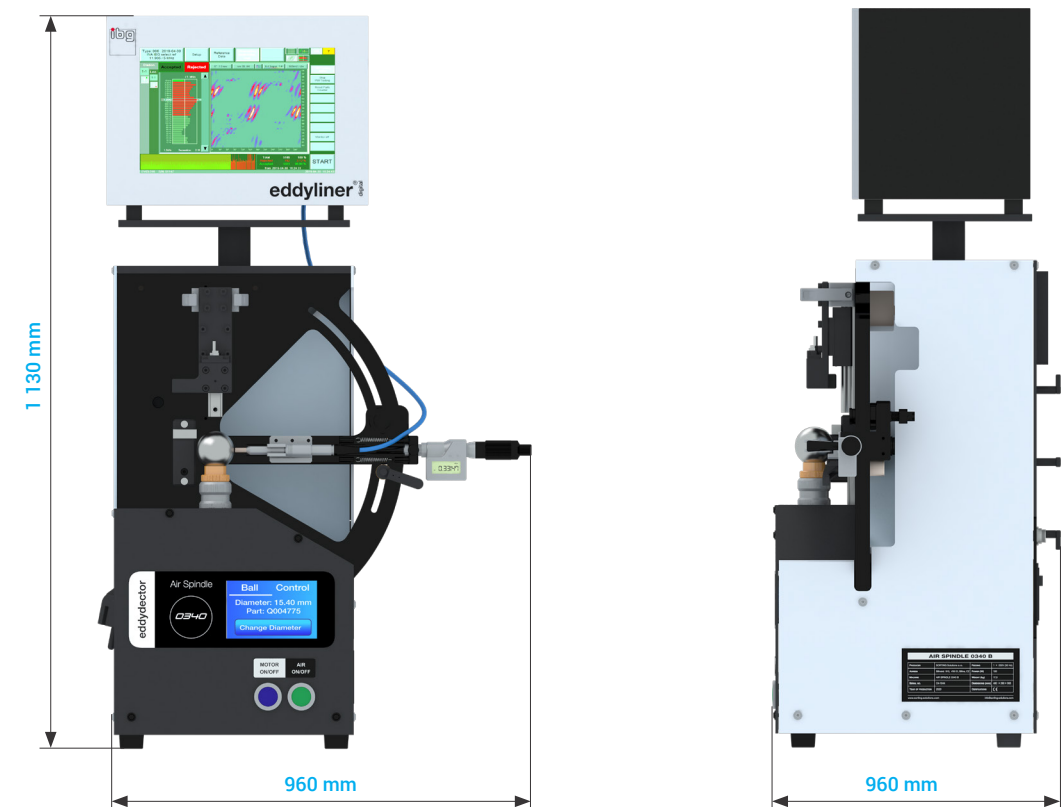
The eddydetector Air Spindle is a universal laboratory testing device for all types of balls. The rotation of the ball is in one axis in order to accurately locate a defect. It is possible to change both the height of the ball and the distance of the sensor from the ball including angle. The ball is held in place by compressed air and the speed of the rotation of the ball can be easily adjusted within the touch-screen. The standard ibg probe and evaluation unit eddyliner C is included.



*Illustration represents
EDDYDECTOR AIR SPINDLE 0340

ORDER INFORMATION

MODEL	BALL DIAMETER (mm)	ORDER NUMBER
EDDYDECTOR AIR SPINDLE 0340	3.000 - 40.000	K 004 530A
EDDYDECTOR AIR SPINDLE 40100	40.000 - 100.000	K 004 930A



Technical Specification

EDDYDECTOR AIR SPINDLE 0340	
Dimensions (LxWxH)	490 x 330 x 850 (mm)
Weight	17.5 kg
Ball diameter	3.000 - 40.000
Spindle RPM	1000 - 4000
Surface speed Ø 40 mm	2094 - 8377 (mm/s)
Surface speed Ø 3 mm	157 - 628 (mm/s)
Lever angle	(-)20° - (+)55°

Options

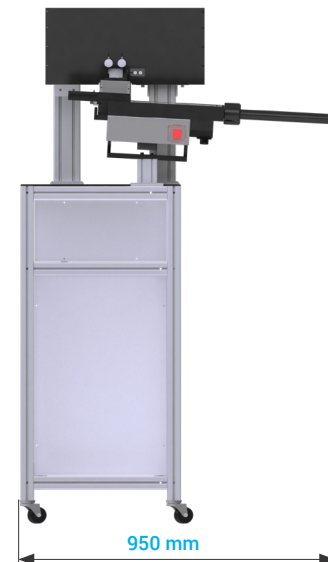
We are offering wide range of options to a company our products (Demagnetizer loaders, elevators, wear and tear testing systems, data collection software and many more) . All options can be ordered separately or as part of the machine. On request the options can be modified up to your specific needs. For more information contact us at sorting-solutions.com

Demagnetizer loader

The demagnetizer is intended to demagnetize balls prior to entering the ball scanners. It is mandatory that balls are demagnetized prior to the scanning process for all ball scanners. The main eddy-current probe is responsible for the detection of cracks and sub-surface defects, which is strongly influenced by the magnetism. This could lead to the false results. The demagnetizer can be connected to the AVIKO ball scanners or used as a standalone unit.

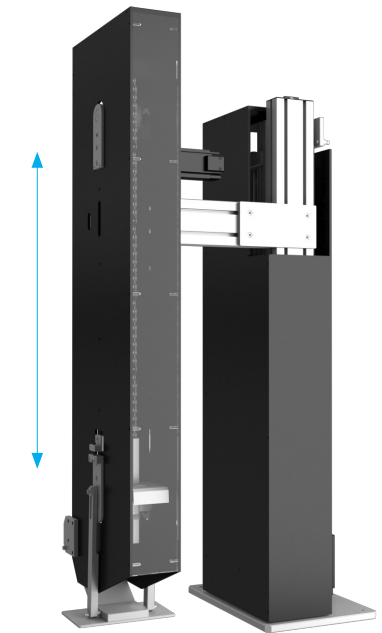


TECHNICAL SPECIFICATIONS	
Dimensions (L×W×H)	1 050 × 950 × 1 600 (mm)
Load	250 kg
Power	230V, 50Hz/60Hz (E plug) 110V, 50Hz/60Hz (B plug)
Range	2.778 - 6.350 mm
Order Number (0306)	K 076 200A



Motorized Y-axis elevator

Elevator can be connected to a main ball distribution system and prepared for the next step in the overall process. The elevator can also be used at the outlet of the AVIKO ball scanner. The upper level of the balls is detected by a sensor at the bottom of the elevator. After the sensor detects the top level, then the elevator moves by the set distance.



	BALL DIAMETER (mm)	ORDER NUMBER
Motorized Y-Axis Elevator 0320	3.000 - 20.000	S 095 000
Motorized Y-Axis Elevator 1830	18.000 - 30.000	S 095 050
Motorized Y-Axis Elevator 3060	30.000 - 60.000	S 095 100
Motorized Y-Axis Elevator 4080	40.000 - 80.000	S 073 970
Motorized Y-Axis Elevator 60100	60.000 - 100.000	S 095 150

Static Elevator

Ground stand stationary elevator has the ability to be connected to all AVIKO ball scanners. The elevator can be used as a input or output elevator. For transportation to the box we recommend the elevator with the motorized vertical movement.



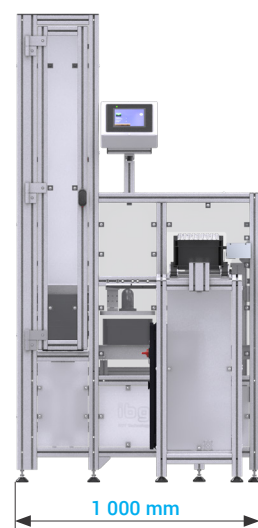
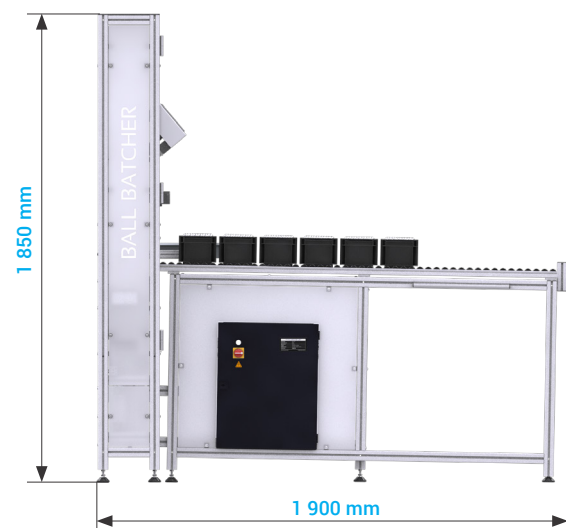
	BALL DIAMETER (mm)	ORDER NUMBER
Static Elevator 0320	3.000 - 20.000	S 095 200
Static Elevator 1830	18.000 - 30.000	S 095 250
Static Elevator 3060	30.000 - 60.000	S 095 300
Static Elevator 4080	40.000 - 80.000	S 095 350
Static Elevator 60100	60.000 - 100.000	S 095 400

Packaging Machine 0319

The packaging machine is designed to pack balls at the same speed of the Aviko ball scanner in order to not slow down the process. Also the packaging machine is capable to operate as standalone unit with the possibility of a direct connection to any machine or straight to the end of production line. As a standard, the packaging machine has a built in anti-corrosive inhibitor/spray which can be activated per the needs of the operator. The machine is equipped with a ball counter and terminal to set the batch size. The loading tower and unloading belt size can be increased per client specifications. This particular design is used only with KTL boxes MF 2120 (198x149x120).



	BALL DIAMETER (mm)	ORDER NUMBER
Packaging Machine 0319	2.778 - 19.050	S 081 500



Packaging Machine (1830; 30100)

We offer packing machines for large balls in two variations 1830 and 30100, where the machine 1830 is designed for packing balls with a diameter of 18 - 30 mm and the machine 30100 for packing balls with a diameter of 30 - 100 mm. The balls are preserved by spray/inhibitor in the anti-corrosion unit, where the oil management system is located directly below the unit. The balls are transported non-contactly into the boxes by means of a robotic arm. Once the empty boxes are filled, the elevator will lower and send the boxes to the collection point, see. picture below.



	BALL DIAMETER (mm)	ORDER NUMBER
Packaging Machine 0330	3.000 - 30.163	S 081 650
Packaging Machine 30100	30.000 - 100.000	S 081 700

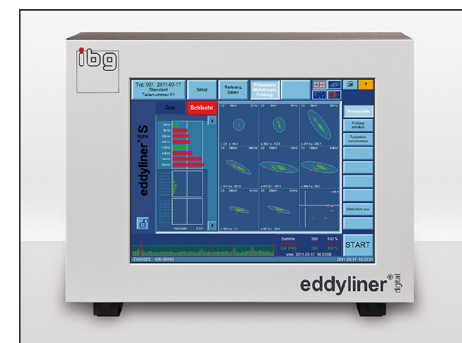
* Order numbers are for inline ball scanner packaging

Structure Testing Units

Digital eddy current test instruments for non-destructive testing of metal components, mass-produced parts and semi-finished products using Preventive Multi-Filter Technology (PMFT). A comparative test for material properties such as hardness, material, tensile strength, heat treatment or alloy. The new ibg family of digital structure test instruments distinguishes itself with the well-proven Multi-Frequency Technology and ibg's good-part-only-concept, furthermore the Simultaneous Harmonic Analysis iSHA and the optional temperature-adaptive structure test iTAS, both unique ibg innovations, offer enhanced opportunities for eddy current structure testing.

eddyvisor® S

The eddy current test instrument eddyvisor® S is designed for testing material mix, heat treatment (hardness, case depth, temper, etc.), sinter density and structure differences with possibility of 2 -32 channels.



eddyliner® S

Digital eddy current test instrument for one channel nondestructive testing of metal components, mass produced parts and semi-finished products according to the Preventive Multi-Frequency Technology (PMFT). Eddyliner is equipped with own HMI.

eddyguard® S

Digital eddy current test instrument for one channel nondestructive testing of metal components, mass produced parts and semi-finished products according to the Preventive Multi-Frequency Technology (PMFT). Eddyguard is intended to be built into the machine.



Coils and Probes

Our wide range of standard accessories includes encircling coils, rectangular coils, inner diameter coils, flat coils and probes. Customized products for special test tasks are provided by our in-house design and manufacturing departments. ibg coils stand out due to highest test sensitivity and temperature stability.

Crack & Grinder Burn Detection Units

Digital eddy current test instruments for non-destructive testing of metal components, mass-produced parts and semi-finished products for cracks, pores and grinder burn using Preventive Multi-Filter Technology (PMFT). The new ibg family of digital crack detection instruments offers first a simultaneous 100% inline detection of grinder burn and cracks in your production lines. Due to automatically generated 360° tolerance zones, testing up to 30 simultaneous band pass filters and ibg's good-part-only concept you will also detect defects which are missed by conventional instruments with a failure-oriented setup.

eddyvisor® C

Multi-channel digital eddy current test instrument for nondestructive testing of components, mass produced parts and semi-finished products for cracks, pores and grinder burn using Preventive Multi-Filter Technology.



eddyliner® C

Digital eddy current test instrument for one channel nondestructive testing of metal components, including mass produced parts and semi-finished products for cracks, pores and grinder burn according to the Preventive Multi-Filter Technology (PMFT). Eddyliner is equipped with own HMI.

eddyguard® C

Digital eddy current test instrument for one channel nondestructive testing of metal components, including mass produced parts and semi-finished products for cracks, pores and grinder burn according to the Preventive Multi-Filter Technology (PMFT). Eddyguard is intended to be built into the machine.



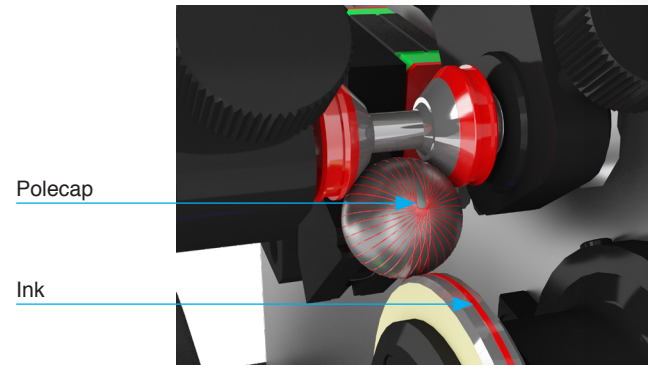
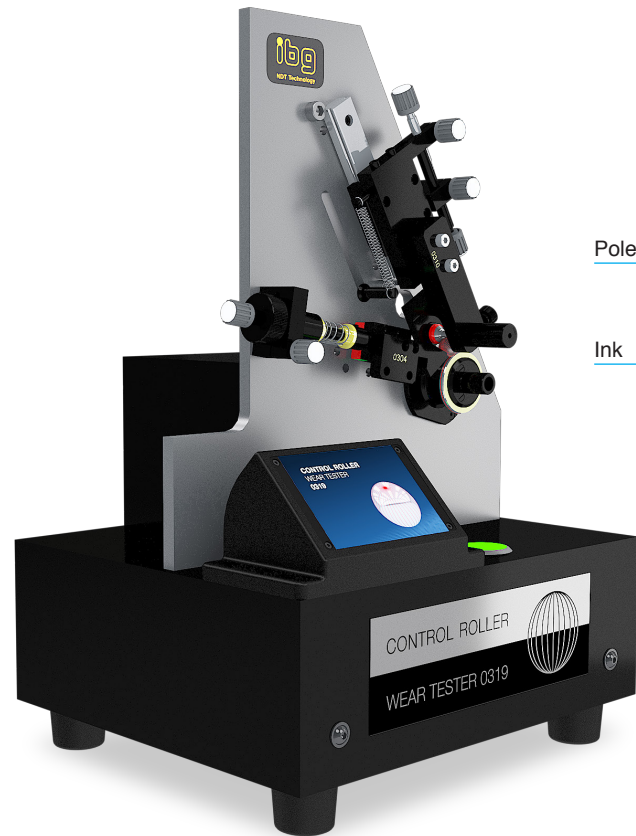
Probes

Certain applications and test systems need probes which are specially designed for that test task, e.g. when testing rough surfaces, when testing teeth and spline areas as well as when testing inaccessible test locations like the inner diameter of hubs. We are pleased to help you with special probes tailor-made for your application and test system.

For more information visit www.ibgndt.de

Control Roller Wear tester

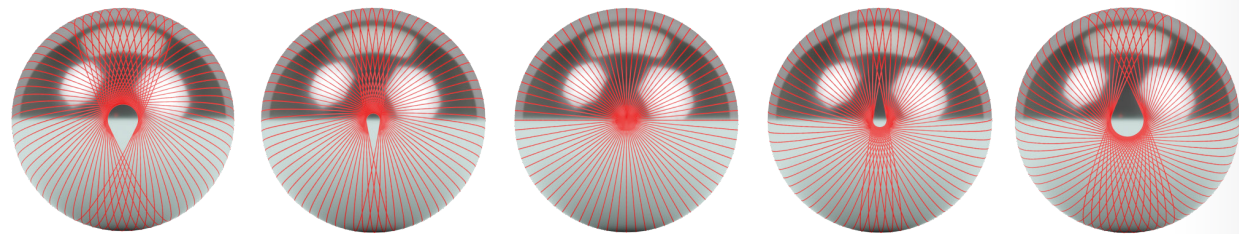
Control roller wear tester is used to check the wear and tear of the control rollers. Ink is applied to the driving disc which is transposed to the ball with our meridian pattern. Illustration below denotes before and after the quality control process.



AVIKO	ACCEPTABLE POLECAP Ø
AVIKO 0203	0.2 mm
AVIKO 0306	0.3 mm
AVIKO 0610	0.5 mm
AVIKO (1014; 1419; 1830)	1.0 mm

New control roller

Max. lifetime



*Control rollers are grinded to the maximum reverse acceptable pole cap, which increases the lifetime of the roller.

	CONTROL ROLLER (mm)		ORDER NUMBER
Control Roller Wear Tester 0203	1.984	- 3.175	K 083 450A
Control Roller Wear Tester 0319	2.778	- 19.050	K 084 000A
Control Roller Wear Tester 1830	18.000	- 30.163	K 084 150A
Control Roller Wear Tester 3070	30.163	- 70.000	K 084 300A

Precision Viewer

Precision data software provides all the necessary tools for correct decision making process which reduces the operational costs. AVIKO ball scanners can be connected to this new software via PC connected to the machine. Data can be collected from multiple machines at once. All collected data can be filtered by operator, batch, date and many more options. Statistics and live view for all the machines can be viewed within the master software.

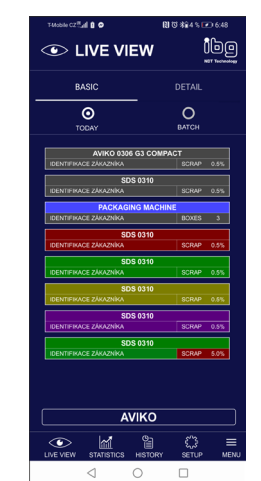
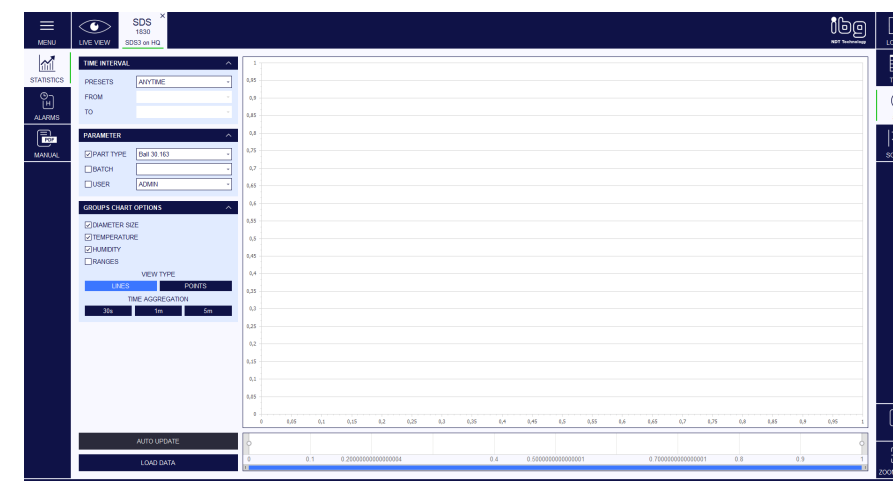
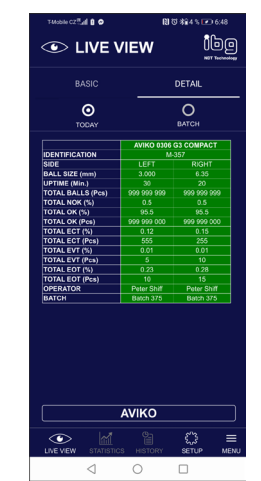
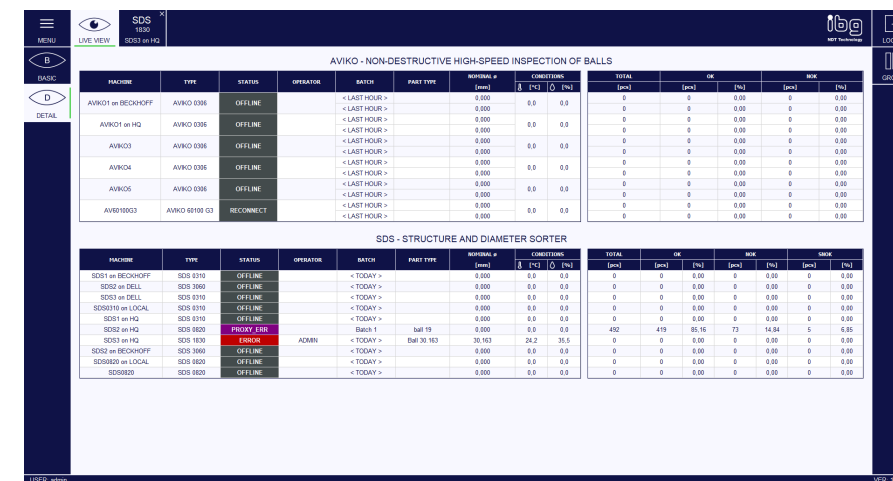
Features

- Data evaluation (graphs and statistics)
- Live monitoring of sorting and status
- Error data log with description and solution
- Complete status and sorting history
- Reduced machine downtime

Machines

- AVIKO ball scanners (G2 and G3)
- Diameter sorters
- Diameter & Structure sorters
- Packaging machines
- DLSR 1865

Precision Viewer can be viewed on mobile phones, tablets or computers. All machines must be connected to a local network or a new independent local network must be established. Application can be downloaded from official stores of IOS and Android systems.



Special Systems

ibg Group offers special systems for the automation of the production process. We provide automation for small and complex processes or the production of special products designed to improve the quality of the production processes. Projects consist of coal packaging line, banknote punching machines, various camera inspections integrated into existing production lines etc. Our large production facilities and extensive team of designers are ready to meet your expectations. Below you can find examples we have designed. Contact information for special systems info@sorting-solutions.com

Notes

Backup Ring Quality Control

In 2021, we designed and developed a system designed to control the quality of safety rings. The rings are separated at fixed intervals by means of a vibrating hopper. After separation, they are transported by a conveyor belt for visual inspection using horizontal and vertical cameras. According to the evaluation, the rings are divided into 24 groups.



Screw Station

Screw station is a complete system designed for defined screw driving. The machine allows you to set the exact tightening torque. Before and after tightening the screw, a visual inspection of the position of the part and the screw is performed by camera system. Once the screw is tightened, the process is evaluated and the operator sends the part for further operations.



NDT Technology

ibg Prüfcomputer GmbH

Pretzfelder Straße 27
D-91320 Ebermannstadt
Germany
Tel: +49 (0) 9194 7384 -0
info@ibgndt.de
www.ibgndt.de

SORTING Solutions s.r.o.

Bílinská 915, 418 01 Břilina
Czech Republic
Phone: +420 417 823 703
Fax: +420 417 821 021
info@sorting-solutions.com
www.sorting-solutions.com

ibg SWISS AG

Galgenried 6
CH-6370 Stans
Switzerland
Tel: +41 41 612 26 50
info@ibgndt.ch
www.ibgndt.ch

ibg NDT Systems

20793 Farmington Road,
Farmington Hills, MI 48336
USA
Tel: 248 478 9490
sales@ibgndt.com
www.ibgndt.com

