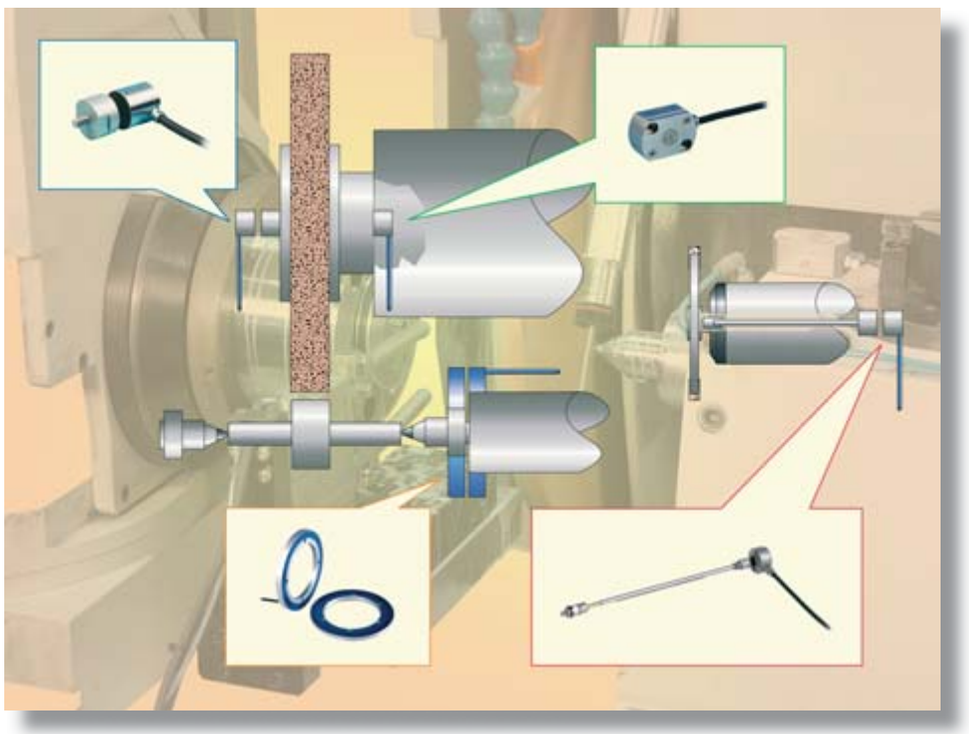
AE Sensors

GRINDING LINE



ACOUSTIC EMISSION SENSORS FOR GRINDING MACHINES

MARPOSS supplies a wide range of acoustic sensors for grinding machines, able to satisfy various requirements including continuous monitoring and air gap check, dressing, grinding wheel and part collision.

These sensors are based on ultrasonic (acoustic emission) technology which can check the noise emitted when the part or the dresser touches the grinding wheel.

This noise typically relates to acoustic emission signals which are high frequency waves, generated by the energy stored and released in the machine structure. Monitoring of these waves and their comparison with a basic reference allows checks of possible changes in condition, for which corrective action may be applied on the machine.

For example, this may be used to identify contact between the grinding wheel and the part, or contact between the grinding wheel and the dressing tool.

Variations in the acoustic emission may indicate changes in the cutting force which can consequently be corrected with adaptive cycles.
For grinding machines the acoustic sensor can be supplied in the most suitable version for positioning as close as possible to the machining where the signal/noise ratio is at its best.

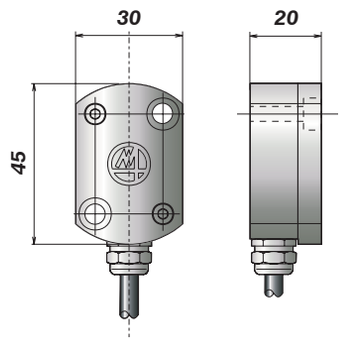
Advantages

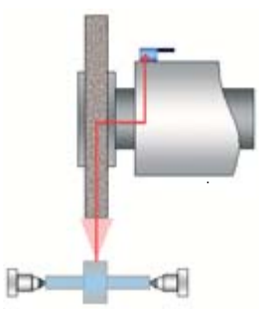
- Shorter process time
- Better protected machine
- Longer wheel life
- Reduced maintenance costs

AE sensor versions and typical applications on grinding machines

Fixed AE sensor

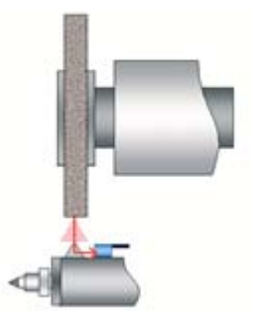
Sensor for ultrasonic acoustic emissions with surface propagation and signal transmission via cable.





EXTERNAL GRINDING
Fixed AE sensor mounted on the external guard of the grinding wheel spindle.

Typical checks:
- Gap & Crash between grinding wheel and part

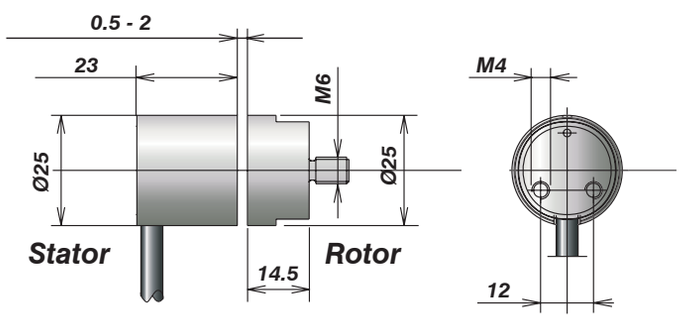


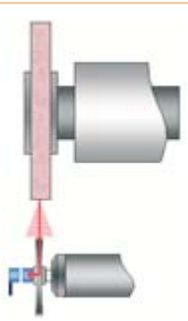
SINGLE POINT DRESSER
AE sensor mounted on dresser.

Typical checks:
- Grinding wheel positioning relative to dresser (Gap)

Contactless AE sensor

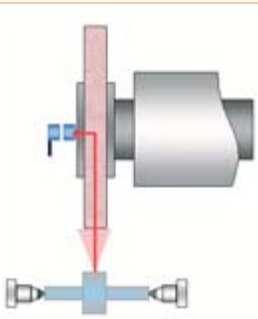
Sensor for ultrasonic acoustic emissions with surface propagation and contactless signal transmission between a rotary part (rotor) and a fixed part (stator).





DRESSING ELECTRO-SPINDLE
Rotary AE sensor mounted on front of dresser disk.

Typical checks:
- Gap & Crash between grinding wheel and dresser
- Dressing profile check

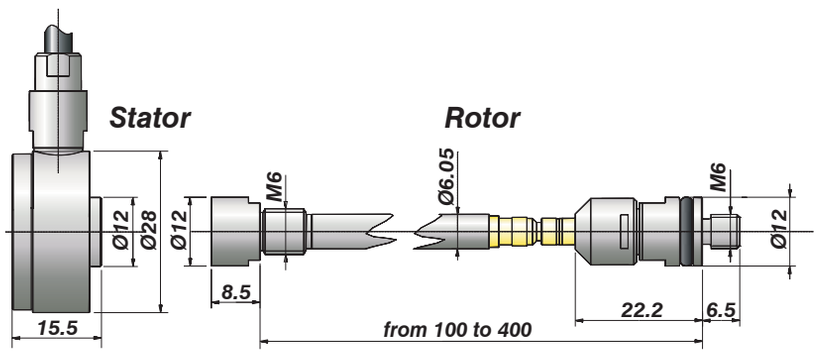


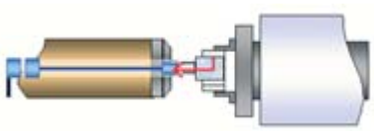
EXTERNAL GRINDING
Rotary AE sensor mounted on front of grinding wheel flange.

Typical checks:
- Gap & Crash between grinding wheel and part
- Grinding wheel positioning relative to dresser (Gap)

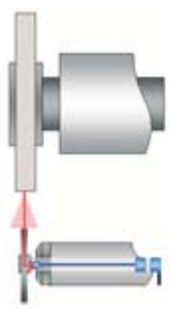
SPLIT AE SENSOR

Sensor for ultrasonic acoustic emissions with surface propagation and contactless signal transmission between a rotary part (rotor) and a fixed part (stator). The rotary part is split and consists of the piezoelectric microphone and the electronic signal transmission part. The sensor dimensions can be adapted to specific application requirements.





INTERNAL GRINDING
Rotary AE sensor mounted inside grinding wheel spindle.
Typical checks:
- Gap & Crash between grinding wheel and part
- Grinding wheel positioning relative to dresser (Gap)

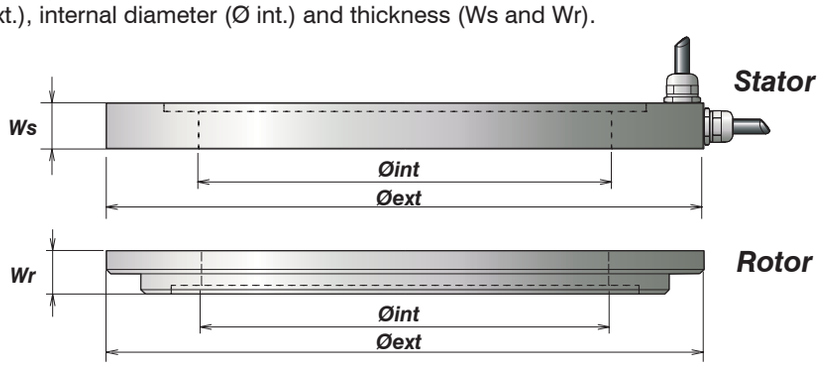


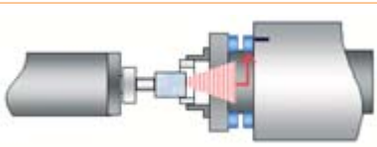
DRESSING ELECTRO-SPINDLE
Rotary AE sensor mounted inside dressing electro-spindle.

Typical checks:
- Gap & Crash between grinding wheel and dresser
- Dressing profile check

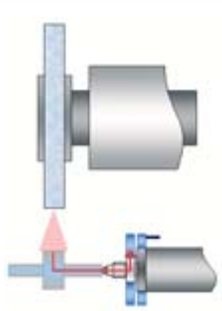
RING-SHAPED AE SENSOR

Sensor for ultrasonic acoustic emissions with surface propagation and contactless signal transmission between a toroidal rotary part (rotor) and a fixed part (stator). The sensor is "customised" according to the machine layout, which determines its external diameter (Ø ext.), internal diameter (Ø int.) and thickness (Ws and Wr).





INTERNAL GRINDING PART SPINDLE
External ring-shaped AE sensor mounted behind the part spindle.
Typical checks:
- Gap & Crash between grinding wheel and part



TAILSTOCK
Ring-shaped AE sensor mounted on part support tailstock.

Typical checks:
- Gap & Crash between grinding wheel and part
- Grinding wheel positioning relative to dresser (Gap)

Fixed AE Sensor

Frequency response	from 50 kHz to 400 kHz
Degree of Protection *(in accordance with IEC 529)*	IP67
Complies with	ASTM E976
Compatible	EMC

Split AE Sensor

Frequency response	from 50 kHz to 500 kHz
Degree of Protection *(in accordance with IEC 529)* with rotor mounted inside spindle	IP67
Distance between rotor and stator	0.5 ÷ 1.5 mm
Speed of rotation	Max. 20,000 rpm
Complies with	ASTM E976
Compatible	EMC

Contactless AE Sensor

Frequency response	from 50 kHz to 350 kHz
Degree of Protection *(in accordance with IEC 529)*	IP67
Distance between rotor and stator	0.5 ÷ 2 mm
Speed of rotation	Max. 20,000 rpm
Complies with	ASTM E976
Compatible	EMC

Ring-shaped AE Sensor

Frequency response	from 50 kHz to 250 kHz
Degree of Protection *(in accordance with IEC 529)*	IP67
Distance between rotor and stator	0.5 ÷ 1.5 mm
Speed of rotation	Max. 10,000 rpm
Complies with	ASTM E976
Compatible	EMC

MARPOSS
www.marposs.com

For a full list of address locations, please consult the Marposs official website

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Marposs has an integrated system to manage the Company quality, the environment and safety, attested by ISO 9001, ISO 14001 and OHSAS 18001 certifications. Marposs has further been qualified EAQF 94 and has obtained the Q1-Award.