



Briiel & Kjær Vibro
a spectris company



Advanced non-contacting eddy-current displacement sensors

Reliable vibration monitoring of rotating shaft machinery

The highest quality sensors for the best results

Quality means a lot for a sensor. No matter how sophisticated the signal processing capability of your monitoring system is, it can never compensate for an under-performing sensor. And we are not just talking about precision. It also has to be robust for the environment it is working in. An inexpensive sensor that unexpectedly breaks down is not just a nuisance, but it also poses a catastrophic risk for critical machinery if there is no monitoring. This applies to many balance-of-plant machines as well. Keep in mind that proper health awareness of your machines depends on quality sensors.

We offer three categories of vibration sensors: **Velocity, acceleration, and non-contacting displacement sensors.** We develop and manufacture the largest part of them at our headquarters in Darmstadt/Germany. In total, we have sold 500,000+ sensors to our satisfied customer base worldwide.

Our **eddy-current displacement sensors (ECDS)** are based on the inductive eddy-current design (see below graphic and description). They monitor rotating and reciprocating machines in a wide range of industries. Used for both machine protection and condition monitoring applications, they typically measure

- **Vibration** (radial and axial shaft vibration and displacement)
- **Reference** (phase reference and speed measurement)
- **Position** (e.g. axial shaft position, rod-drop/rod position).

These measurements will help identify common machine faults like unbalance and misalignment.

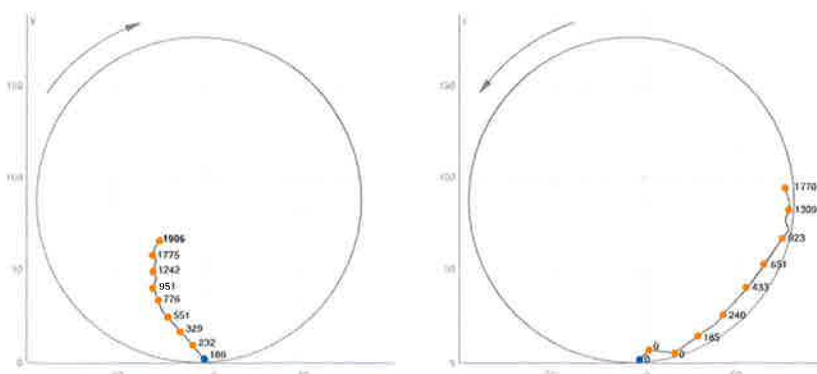
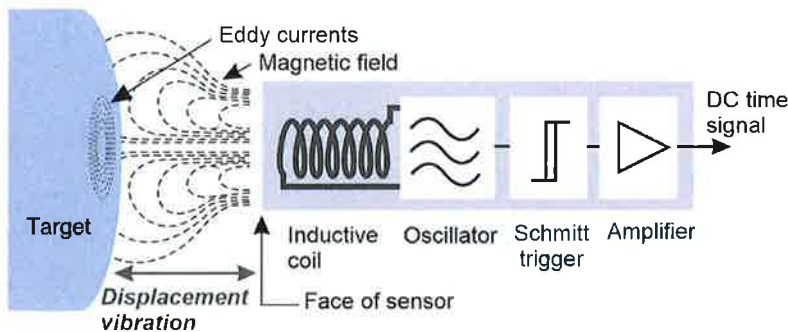
Machine problems typically detected by displacement sensor measurements

- Unbalance
- Misalignment
- Bent shaft
- Eccentricity
- Shaft crack
- Coupling problems
- Oil whirl
- Oil whip
- Rotor rub

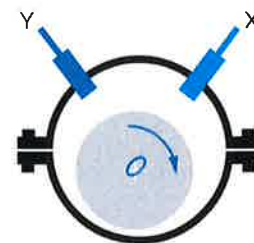
Principle of Operation

The displacement sensor oscillator generates a constant frequency sine wave that passes through an inductive coil, which produces an electromagnetic field in front of the sensor face. When a target metal object comes close to this field, some of the electromagnetic energy is transferred to the target as eddy currents. This transfer of energy reduces the amplitude of the oscillator, which is inversely proportional to the distance of the target metal object being monitored to the face of the sensor.

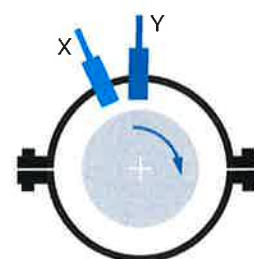
Principle of Operation



Shaft centerline plot of a large electric motor driving a compressor showing good (left) and bad (right) vibrational behaviour



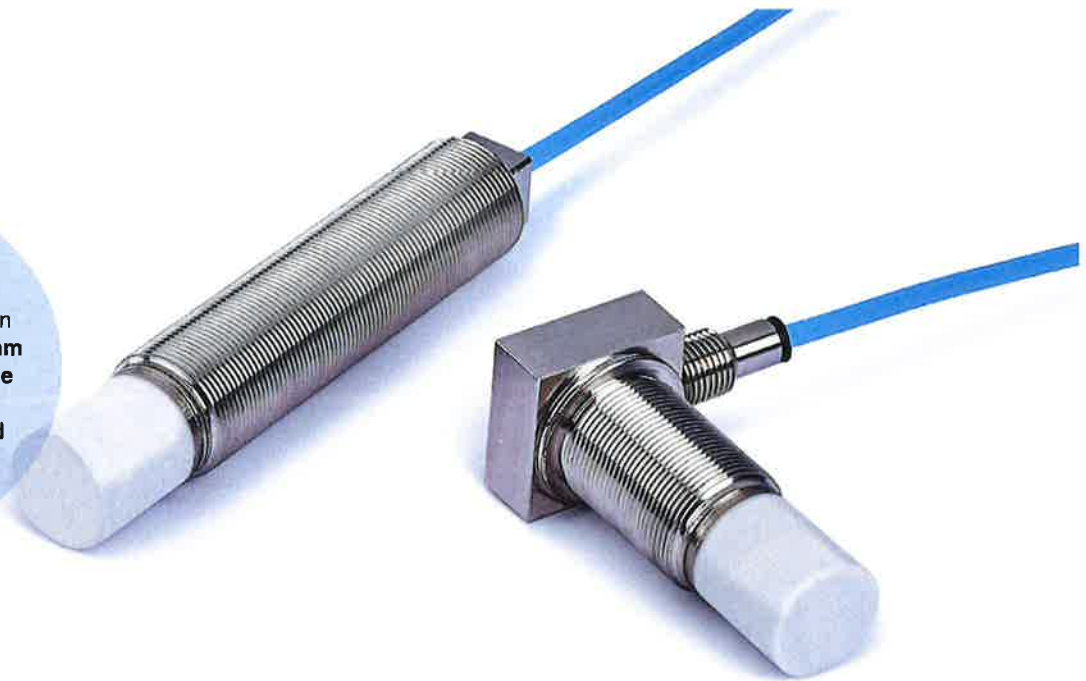
Radial vibration



Speed, rotation, phase

NEW!

The family has now been completed by a new 8mm linear range sensor, the ds821.mc501. It is available in straight and angled versions.



ECDS Series ds82x: proven technology, modern design

Brüel & Kjær Vibro has a long tradition in providing high-quality sensors. The first ECDS systems by Brüel & Kjær Vibro were designed in the 1970's and have successfully served various demanding markets and applications ever since. The SD-16x series in particular (8 mm linear range) has been in use since 1979 in countless applications world-wide. The newly developed ds82x ECDS was designed to replace the aging SD-16x series while maintaining the same high standard of design, construction, performance and reliability. Improvements include extended size selection, a new connection concept and versatile new tip design.

The ds82x family of ECDS systems consists of:

Series ds821

Suitable for standard applications - now available in 2 mm, 4 mm and 8 mm linear measuring ranges.

The family has now been completed by a new 8mm linear range sensor available in a straight and an angled version to match all mounting conditions on site.

Series ds822

For use in hazardous environments (ATEX, IECEx, EAC Ex, UL HazLoc) - available in 2 mm and 4 mm measuring ranges.

Series ds821 and ds822 benefits:

- **Auto selection of system length:**
The same ECDS oscillating driver unit can be used for both 5 m and 10 m cable lengths which minimizes inventory costs and simplifies installation.
- **Push-pull self-latching connectors:**
They ensure secure, fast and easy installation on site and avoid wrong assembly.
- **Very good EMC behaviour**
- **Excellent temperature stability**
- **Ceramic probe tip for use in harsh environments**
- **Robust, high reliability**
- **API 670 compliance**



Upgrade now to cutting-edge technology!

As the highly successful but aging SD-05x, SD-08x, SD-16x, and DS-105x displacement sensor series will soon leave our product portfolio, now is the time to act and upgrade to the new ds82x series!

Benefit from enhancement, like

- Auto selection of system length
- Push-pull self-latching connectors
- Ceramic probe tip
- Robust, high reliability
- API 670 compliance



Select your existing ECDS system from the table below and choose the equivalent from among the ds82x series.

Switch to the new generation

To order a complete measuring chain (ds82x.mc = sensor + driver + connection cable), you only need one product number. The universal driver will automatically detect a 5 m or 10 m system length.

Brüel & Kjær Vibro legacy product	Product (ds82x series)	Linear measuring range	Tip diameter category	Deviation from best fit straight line (DSL)*	Incremental scale factor (ISF)	Incremental scale factor error (ISF error %)*	Hazardous area approval
SD-05x series (sensor) OD-05x series (driver/oscillator) EC-00x series (connection cable)	ds821.mc101	2 mm	8 mm	± 25 µm	8 mV/µm	± 5%	No
SD-08x series (sensor) OD-08x series (driver/oscillator) EC-00x series (connection cable)	ds821.mc301	4 mm	11 mm	± 50 µm	4 mV/µm	± 5%	No
SD-16x series (sensor) OD-16x series (driver/oscillator) EC-00x series (connection cable)	ds821.mc501	8 mm	18 mm	± 150 µm	2 mV/µm	± 5%	No
DS-105x series (sensor) OD-105x series (driver/oscillator) EC-100x series (connection cable)	ds822.mc101	2 mm	8 mm	± 25 µm	8 mV/µm	± 5%	Yes
none	ds822.mc301	4 mm	11 mm	± 50 µm	4 mV/µm	± 5%	Yes

Please note: For more detailed and up-to-date official technical data, please refer to the respective product specification sheet, *at 0°...45° C and a 5m system length

Contact us at sales@bkvibro.com or visit us at www.bkvibro.com for more information.

