

# Industrial Structure-Borne Noise Sensors

## Configurable sensor sets



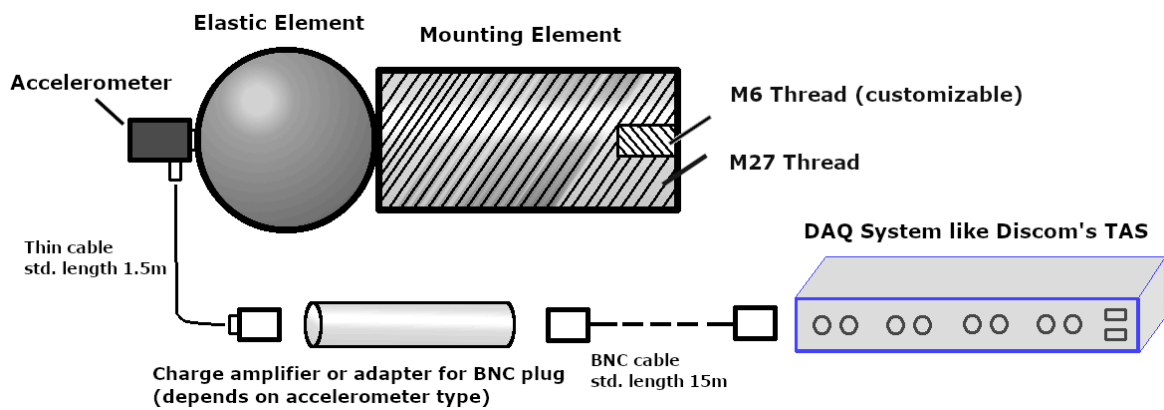
- ✓ Configurable sensor sets consisting of wide range of accelerometers combined with different types of elastic elements enable optimal solution for industrial testing
- ✓ Robust, high quality, wide bandwidth, low noise piezo accelerometers for structure-borne noise measurement
- ✓ Elastic elements to mechanically and electrically decouple mounting and accelerometer

## Structure-Borne Noise Sensors with Elastic Elements

Discom offers a variety of structure-borne noise sensors, consisting of piezo accelerometers and elastic elements as mounting adapters.

- small and very light accelerometers offer high bandwidth
- silicon ball or tube as elastic element for mounting prevents resonance with machinery
- electrical isolation from device under test
- accelerometer and elastic element combinations offer a wide range of industrial measurement solutions
- piezo accelerometers available as IEPE (same as ICP® or CCLD®) and charge versions

A sensor set consists of a combination of accelerometer, elastic element, cables, and amplifier or adapter.



## 1 [Accelerometers](#)

### 1.1 [KS91E, KS91E1, KS91E3](#)

The **KS91E** types are Discom's standard **IEPE**-compatible accelerometers.

### 1.2 [KS91F1, KS91F2](#)

The **KS91F** types are **IEPE** accelerometers with high sensitivity. The **KS91F2**'s main sensitivity is in **transverse direction**.

### 1.3 [KS91D, KS91D1](#)

The **KS91D** accelerometers have a **charge** output and require additional signal conditioning with a charge-to-IEPE preamplifier.

## 2

### 2.1 [BKS03](#)

Discom's standard elastic element for slightly **rounded** or **tilted** surfaces.

### 2.2 [BKS10, BKS10HD, BKS10Triax](#)

For **tighter** spaces. **BKS10HD** has increased shore hardness.

### 2.3 [MSV18](#)

Elastic element for **magnetic** sensor.

## 3 [Sets and Combinations](#)

### 3.1 [Combination Matrix](#)

### 3.2 [Standart Combinations](#)

### 3.3 [Spare parts](#)

## 1.1 Accelerometers KS91E, KS91E1, KS91E3

KS91E, KS91E1, KS91E3 – Basic Specifications		
Sensor Type	IEPE-subminiature accelerometer with ring-shaped probe	
Piezo Design	shear design	
Sensitivity	10mV/g ±10%	
Range	±600g (peak)	
Linear Frequency Range	±3dB	0.3 Hz .. 23 kHz
	±10%	0.6 Hz .. 18 kHz
	±5%	0.9 Hz .. 15 kHz
Operating Temperature	-40°C .. +120°C	
Connector	M3, female	
<b>Mechanical</b>		
Dimensions ( Ø / h )	KS91E: 7.8mm / 11.6mm KS91E1: 7.8mm / 15.5mm KS91E3: 7.8mm / 16.4mm	
Weight	KS91E: 1.6g KS91E1: 1.65g KS91E3: 1.65g	without cable
<b>Types &amp; Mounting Adapters</b>		
KS91E	BKS03	cable <i>radial</i>
KS91E1	BKS10, BKS10HD	cable <i>axial</i>
KS91E3	MVS18	cable <i>axial</i> , special thread



KS91E1/KS91D1/KS91F1



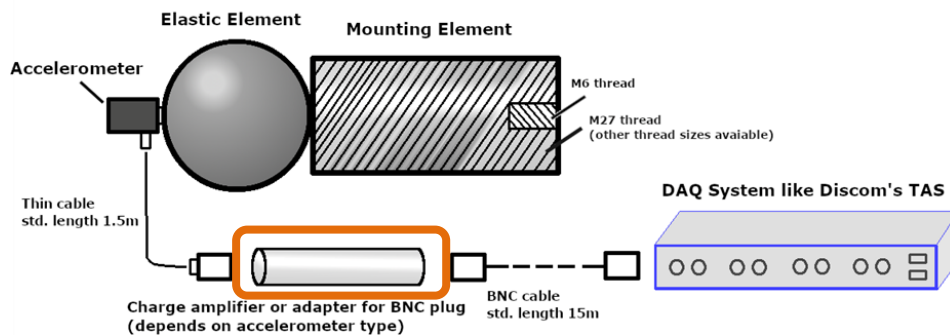
KS91E/KS91D

## 1.2 Accelerometers KS91F1, KS91F2

KS91F1, KS91F2 – Basic Specifications			
Sensor Type	IEPE accelerometer with ring-shaped, insulated probe made of stainless steel		compatible with all of Discom's TAD inputs
Piezo Design	shear design		
Sensitivity	25mV/g ±20%		
Range	±240g (peak)		
Linear Frequency Range KS91F1	±3dB ±10% ±5%	0.3 Hz .. 30 kHz 0.6 Hz .. 18 kHz 0.9 Hz .. 15 kHz	
Linear Frequency Range KS91F2	±3dB ±10% ±5%	0.6 Hz .. 12.5 kHz 1.1 Hz .. 8.0 kHz 1.5 Hz .. 6.8 kHz	
Operating Temperature	-30°C .. +120°C		
Connector	M3, female		
<b>Mechanical</b>			
Dimensions ( ∅ / h )	KS91F1: 7.8mm / 15.5mm KS91F2: 8.5mm / 16.0mm		
Weight	KS91F1: 1.65g KS91F2: 2.6g		without cable
<b>Types &amp; Mounting Adapters</b>			
KS91F1	BKS10, BKS10HD		cable axial

## 1.3 Accelerometers KS91D, KS91D1

KS91D, KS91D1 – Basic Specifications		
Sensor Type	charge accelerometer with electrically isolated stainless steel ring	charge-to-IEPE preamplifier needed to connect to TAD input – Discom offers according preamplifiers <sup>1</sup>
Piezo Design	shear design	
Sensitivity	2.5pC/g ±10%	
Range <sup>1</sup>	±4000g (peak)	
Linear Frequency Range	±3dB ±10% ±5%	0.05 Hz .. 23 kHz 0.1 Hz .. 18 kHz 0.15 Hz .. 15 kHz
Ceramic / Piezo Capacitance	250pF ±10%	
Operating Temperature	-40°C .. +150°C	
Connector	M3, female	
<b>Mechanical</b>		
Dimensions ( ∅ / h )	KS91D: 7.8mm / 11.6mm KS91D1: 7.8mm / 15.5mm	
Weight	KS91D: 1.8g KS91D1: 1.85g	without cable
<b>Types &amp; Mounting Adapters</b>		
KS91D	BKS03	cable <i>radial</i>
KS91D1	BKS10, BKS10HD	cable <i>axial</i>



<sup>1</sup> Range with various Amplifiers		
Amplifier	Charge Conversion [mV/pC]	Range [g]
422E51	100	40
422E52	10	400
422E53	1	4000

### 2 Elastic Elements

The elastic elements provide optimal mounting options for industrial applications, while damping vibrations from the machinery.



*BKS03 with M27 thread, BKS10 and BKS10 Triaxial with adapter to BKS03 thread*

## 2.1 BKS03

Can be applied to slightly rounded<sup>1</sup> or tilted surfaces.

Max. deviation from vertical direction: 5°

Smooth (finished) surfaces recommended.

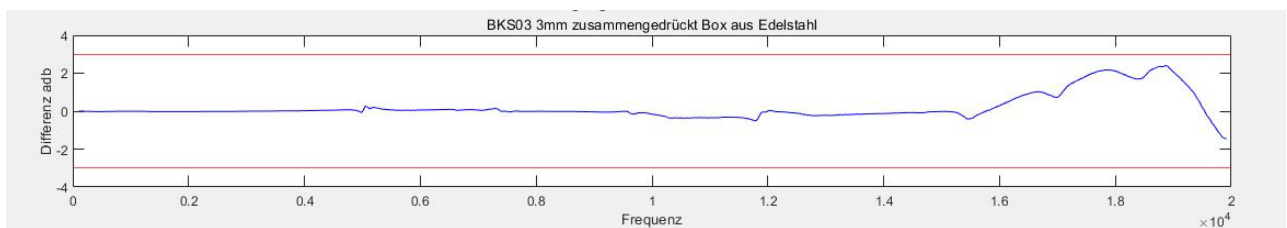
Press in by 2 to 4 mm (press-on force 15 – 35 N).

**Recommended pressure: 3mm displacement (25 N)**



BKS03 (here combined with [KS91E](#) Accelerometer)

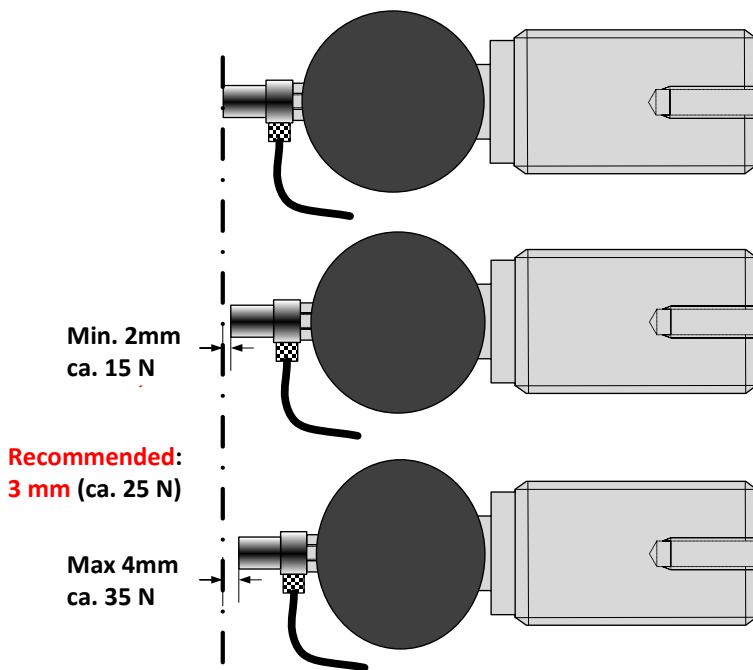
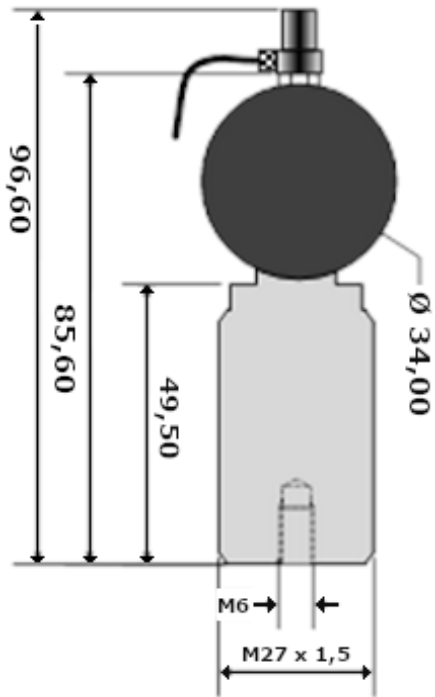
Reference measurement comparing a 3mm pressed-on BKS03 with a fixed mounted KS91E:



Deviation between sensors is < 3 dB up to 20 kHz.

Non-perpendicular application or rounded surface will reduce linearity range.

<sup>1</sup> Special sensor tips for rounded surfaces are available on request



### Press-on specification BKS03:

In engaged position, the elastic element should be pressed in by 3 mm or a force of 25 N.



## 2.2 BKS10, BKS10HD, BKS10Triax

For tight spaces.

To be applied to flat surfaces.

Max. deviation from vertical direction: 1°

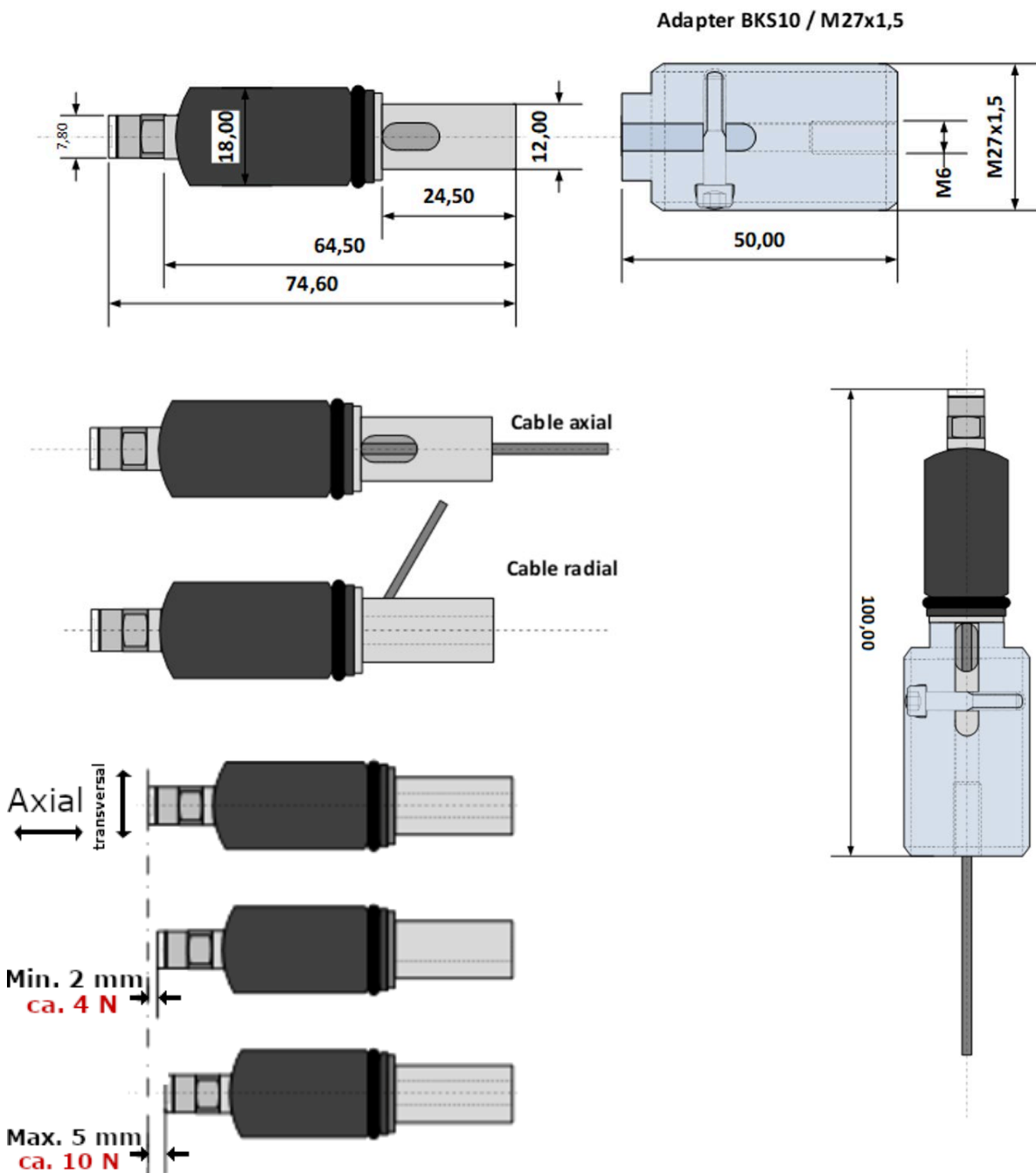
Smooth (finished) surfaces required.

Cable is protected inside of elastic element.

Press in by 2 to 5 mm (pressure force 4 – 10 N).

The BKS10HD has an increased shore hardness.

**Press-on specification:** BKS 10 (black) 4 mm = 10N; BKS10HD (blue) 3 mm = 25 N.



### 2.3 MVS18

Magnetically attached, works only with magnetic surfaces.

**Different magnet sizes and strengths available.**

Cable with coaxial connector that can turn and resist high force:



*MVS2018*

## 3.1 Combination Matrix

The following table shows the available combinations of accelerometer and elastic element for mounting.

Elastic Element Accelerometer	BKS03	BKS10	BKS10HD	BKS10 Triax	MVS18
<b>KS91E</b> cable radial IEPE, 10mV/g	✓	(✓) <sup>1</sup>			
<b>KS91E1</b> cable <i>axial</i> IEPE, 10mV/g		✓	✓		
<b>KS91E3</b> cable <i>axial</i> , special thread IEPE, 10mV/g					✓
<b>KS91F1</b> cable <i>axial</i> IEPE, 25mV/g		✓	✓		
<b>KS91F2</b> cable <i>axial</i> , Piezo radial IEPE, 25mV/g		✓	✓		
<b>KS91D</b> cable radial Charge, 2.5pC/g	✓	(✓) <sup>1</sup>			
<b>KS91D1</b> cable <i>axial</i> Charge, 2.5pC/g		✓	✓		
<b>B&amp;K 4519-001</b> cable radial IEPE, 100mV/g	✓				
<b>PCB 356A32</b> cable <i>axial</i> , 4-pin connector Triax IEPE, 100mV/g				✓	
<b>PCB 356A03</b> cable <i>axial</i> , 4-pin connector Triax IEPE, 10mV/g	✓				

<sup>1</sup>Adapter required (Art.: 02623)

Other accelerometer/ mounting options are available on demand!

## 3.2 Standard Combinations

This table shows the most frequent component combinations which can be ordered as a set:

Standard sensor sets for Discom measurement systems			
Order No.	Accelerometer	Elastic element	Scope of delivery
1-DC/BKS03D	KS91D	BKS03 <sup>1</sup>	<ul style="list-style-type: none"> <li>✓ External charge-to-IEPE Amplifier (10mV/pC)</li> <li>✓ 15m BNC cable</li> <li>✓ 1.5m sensor cable</li> </ul>
1-DC/BKS03E	KS91E	BKS03 <sup>1</sup>	<ul style="list-style-type: none"> <li>✓ Built-in IEPE Amplifier (10mV/g)</li> <li>✓ 15m BNC cable</li> <li>✓ 1.5m sensor cable</li> </ul>
1-DC/BKS03TRI	356A03	BKS03 <sup>1</sup>	<ul style="list-style-type: none"> <li>✓ Built-in IEPE Amplifier (10mV/g)</li> <li>✓ 3x 15m BNC cable</li> <li>✓ 3m sensor cable</li> </ul>
1-DC/BKS10	KS91E	BKS10 <sup>2</sup>	<ul style="list-style-type: none"> <li>✓ Built-in Amplifier (10mV/g)</li> <li>✓ 15m BNC cable</li> <li>✓ 1.5m sensor cable</li> </ul>
1-DC/BKS10D	KS91D1	BKS10 <sup>2</sup>	<ul style="list-style-type: none"> <li>✓ External charge-to-IEPE Amplifier (10mV/pC)</li> <li>✓ 15m BNC cable</li> <li>✓ 1.5m sensor cable</li> </ul>
1-DC/BKS10HD	KS91E1	BKS10HD <sup>3</sup>	<ul style="list-style-type: none"> <li>✓ Built-in IEPE Amplifier (10mV/g)</li> <li>✓ 15m BNC cable</li> <li>✓ 1.5m sensor cable</li> </ul>
1-DC/MVS18	KS91E3	MVS18 <sup>4</sup>	<ul style="list-style-type: none"> <li>✓ Built-in IEPE Amplifier (10mV/g)</li> <li>✓ 15m BNC cable</li> <li>✓ 3m sensor cable</li> </ul>

### 3.3 Sensor set spare parts and for separate order

Name	Article no.	Scope of delivery
<b>BKS03-E</b> Sensorset; (1-DC/ACCSET_BKS03E)	02681	<ul style="list-style-type: none"> <li>-<b>BKS03-FE</b> elastic element [art.: 01716]</li> <li>-<b>KS91E</b> accelerometer, accelerometer sensitivity: 10mV/g; range: +-600g [art.: 01018]</li> <li>-<b>Sensor cable</b> 1.5 m [art.: 02619]</li> <li>-<b>UNF10-32 / BNC</b> adapter [art.: 00281]</li> </ul>

## Sensor Set Components

<b>BKS03-D</b> Sensorset; (1-DC/ACCSET_BKS03D)	02682	- <b>BKS03-FE</b> elastic element [art.: 01716] - <b>KS91D</b> accelerometer, sensitivity 2.7 pC/g, range: +-4000g [art.: 01021] - <b>Sensor cable</b> 1.5 m [art.: 02619]
<b>BKS03-TRIAX</b> Sensorset; [1-DC/ACCSET_TRI03]	04728	- <b>BKS03-FE</b> elastic element [art.: 01716] - <b>PCB-356A03</b> Accelerometer Triaxial (v.2021) sensitivity: 10mV/g; range: +-500g, glued in special housing for use with BKS03 [art.: 04639] - <b>PCB-034G10</b> sensor cable 3m, 4Pin/3xBNC [art.: 02840]
<b>BKS10-E</b> Sensorset; (1-DC/ACCSET_BKS10E)	02683	- <b>BKS10 FE</b> elastic element [Art.: 02616] - <b>KS91E1</b> accelerometer, sensitivity: 10mV/g; range: +-700g [Art.: 02618] - <b>Sensor cable</b> 1.5 m [Art.: 02619] - <b>UNF10-32 / BNC</b> adapter [Art.: 00281]
<b>BKS10-TRIAX</b> Sensorset; (1-DC/ACCSET_TRI10)	04729	- <b>BKS10-TRIAX FE</b> elastic element [art.: 03345] - <b>PCB-356A32</b> accelerometer triaxial sensitivity: 100mV/g; range: +-50g; 1-4000Hz; modified for BKS10 Triax [art.: 03335] - <b>PCB-034K10</b> sensor cable 3m, 4Pin / 3xBNC [art.: 03334]
<b>KS91E</b> Accelerometer (1-DC/ACC_KS91E)	01018	- <b>KS91E</b> accelerometer, sensitivity: 10mV/g; range: +-600g - <b>Sensor cable</b> 1.5 m [art.: 02619] - <b>UNF10-32 / BNC</b> adapter [art.: 00281]
<b>KS91D</b> Accelerometer (1-DC/ACC_KS91D)	01021	- <b>KS91D</b> Accelerometer, sensitivity: 2,7pC/g; range: +-4000g - <b>Sensor cable</b> 1.5 m [art.: 02619]
<b>KS91E1</b> Accelerometer (1-DC/ACC_KS91E1)	02618	<b>KS91E1</b> Accelerometer, sensitivity: 10mV/g; range: +-700g - <b>Sensor cable</b> 1.5 m [art.: 02619] - <b>UNF10-32 / BNC</b> adapter [art.: 00281]
<b>KS91F1</b> Accelerometer (1-DC/ACC_KS91F1)	03130	<b>KS91F1</b> Accelerometer, sensitivity: 25mV/g; range: +-700g - <b>Sensor cable</b> 1.5 m [art.: 02619] - <b>UNF10-32 / BNC</b> adapter [art.: 00281]
<b>Sensor cable 0,3m</b> (1_DC/CAB_ACC_0.3)	02854	<b>Sensor cable</b> Connectors: M3/UNF10-32, length 0,3m; with silicone protective tubing
<b>Sensor cable 1,5m</b> (1-DC/CAB_ACC_1.5)	02619	<b>Sensor cable</b> (Connectors: M3/UNF10-32, length 1.5m with silicone protective tubing
<b>BKS03 FE</b> (1-DC/EE_BKS03)	01716	<b>BKS03 FE</b> Elastic element black silicone compound, hardness: 7 Shore
<b>BKS10 FE</b>	02616	<b>BKS10 FE</b> Elastic element

## Sensor Set Components

(1-DC/EE_BKS10)		black silicone compound, hardness: 7 Shore
<b>BKS10-FE HD</b> (1-DC/EE_BKS10HD)	03340	<b>BKS10-FE HD</b> Elastic element blue silicone compound, hardness: 21 Shore
<b>BKS10 Triax FE</b> (1-DC/EE_BKS10TRI)	03345	<b>BKS10 Triax FE</b> Elastic element for Triaxialsensor blue silicone compound, hardness: 21 Shore