SensiChecker

Tricky testing of the loop sensitivity
of shaft vibration and axial position measuring systems

Instruction Manual

Contents:

1 Warning

The instruction manual is an integrative part of the product delivery and the overall security concept of the product. Please read the instruction manual carefully before using the product, and keep it available for future reference. Non-observance of warning information excludes the manufacturer from liability! The measuring system is only allowed to be put into operation by qualified personnel who have previously read the information provided in this instruction manual. In case of doubt, the prevailing conditions of the area of application and the resulting requirements have to be examined by an expert before operation can be commenced.

Correct transportation, appropriate storage and professional assembly, operation and maintenance must be provided in order to ensure perfect functioning.

2 Ordering Codes

SensiChecker:

KS05-A1 = **Metric** version: distance change 0.2 mm per "click" (thread pitch 1 mm), 600 g
KS05-A2 = **Imperial** version: distance change 10 mils per "click" (thread pitch 50 mils), 600 g

Accessories:

KS05-B1 = **Adapter Screw** (for mounting at the original measuring point)
Screw-in thread G3/4" male / 235 g

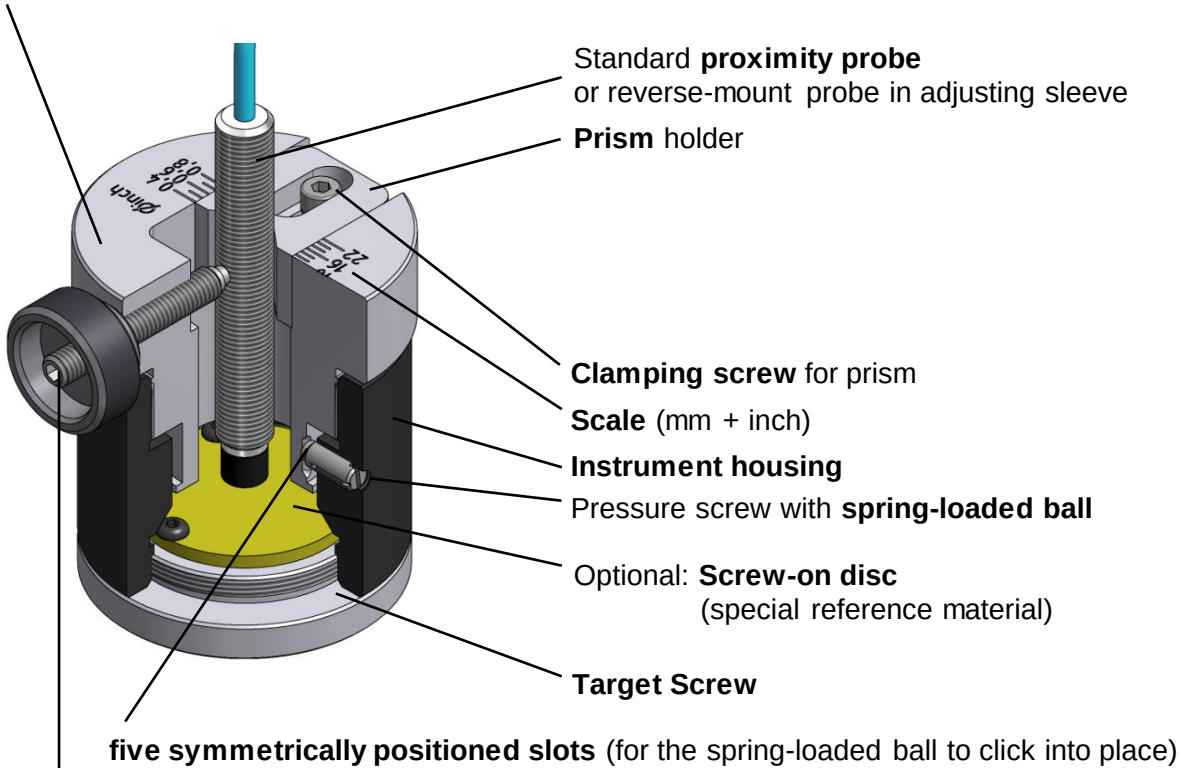
KS05-C1 = **Housing Adapter** (between machine housing and adapter screw)
Screw-in thread 3/4" NPT male / connecting thread G3/4" female / 165 g

KS05-D1 = **Prismatic Shaft Adapter** (for direct mounting on disassembled original rotor shaft)
Connecting thread G3/4" female / 210 g

KS05-AX-BX-CX-DX = **SensiChecker Kit**, including all selected accessories

3 Technical Data

Gap Adjusting Ring (with thread pitch A1 = 1.0 mm or A2 = 50 mil resp. 1.27 mm)



Material of Target Screw (unit bottom): AISI 4140 (42CrMo4)

Material of instrument housing and Gap Adjusting Ring: Aluminum

Material of Adapter Screw / Reference Face Adapter: Stainless Steel (1.4305)

Dimensions: D x H: 57 x 70 mm

Weight: see ordering code!

Suitable for probe or probe sleeve diameters of 8 … 22 mm

4 Description of the Test Procedure

4.1 Determination of the Measuring Loop Sensitivity

The **SensiChecker** is used to determine/test the sensitivity of a non-contact measuring, eddy current measurement chain, as typically applied for the measurement of the shaft vibration and axial position. Weak points of probe, cable and oscillator will be detected.

The Target Screw at the bottom of the SensiChecker serves as measurement reference. It is made of AISI 4140 (42CrMo4), which is the standard reference material relating to a sensitivity of 8 mV/µm resp. 200 mV/mil.

For optional calibration with special material, a custom-made disc (∅: 40 mm, thickness: 3 mm, PC∅: 34.8 mm, 3 bores ∅ 3.4 mm) can be screwed on the Target Screw.

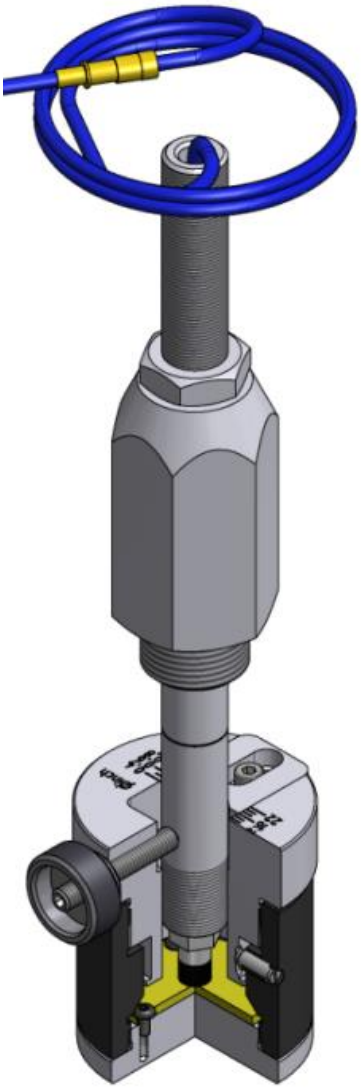
In order to ascertain a totally accurate calibration, the determination of the loop sensitivity has to be made with the original measuring chain against the shaft material at the original measuring point. This possibility is provided by the SensiChecker in connection with the adapter screw.

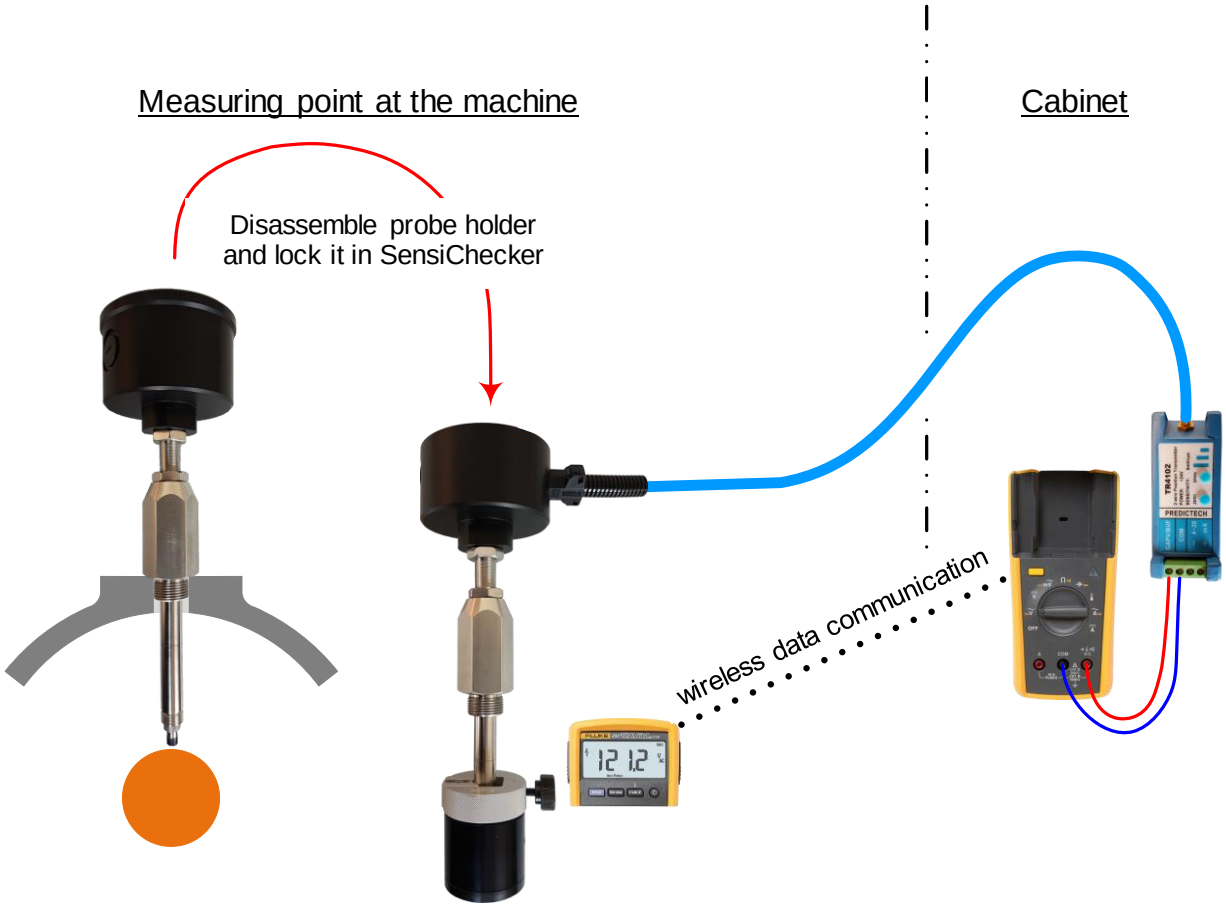
The standard sensitivity of an eddy current measuring chain is 8 mV/µm or 200 mV/mil (= 7.87 mV/µm).

1 mil = 1/1000 inch = 25.4 µm

4.2 Check against reference material

1. Screw the GAP adjusting ring as far as possible into the housing, but only until you feel it engage with a click.
2. Carefully insert the probe or the probe holder from above into the GAP adjusting ring until it reaches the target material at the bottom; lock it in the prism with the aid of a clamping screw. The prism is suitable for diameters ranging from 8 to 22 mm.
3. Wire up the probe so that the GAP signal can be read on a multimeter. Check the oscillator voltage supply in accordance with the type plate!
   The GAP voltage signal can be tapped on both the oscillator and on the vibration monitor (BNC connection or clamp "GAP" and "COM").





kmo turbo recommends using a multimeter with removable display. The wired multimeter stays in the control cabinet. The removable display can be attached at an ideal level of vision to the machine housing with the aid of a magnet. This makes handling particularly comfortable. Furthermore, this also allows the test to be carried out by just one person.

4. We recommend that you should use the Excel evaluation form provided on the internet by **kmo turbo** in order to record and evaluate the test results.

   http://www.kmo-vibro.de/images/PDF/sensichecker-evaluationform.xls

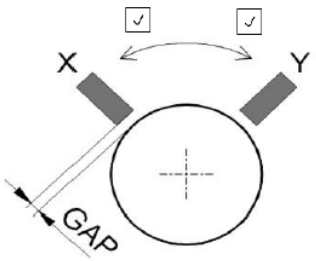
Characteristic displacement measurement

Determination of sensitivity [mV/µ] of eddy current measurement

GAP	X	Y
mm	V DC	V DC
0,5	3,00	4,00
0,7	4,00	5,50
0,9	5,00	7,00
1,1	6,00	8,50
1,3	7,00	10,00
1,5	8,00	11,50
1,7	9,00	13,00
1,9	10,00	14,50
2,1	11,00	16,00
2,3	12,00	17,50
2,5	13,00	19,00

Sensitivity: 5,0 mV/µm

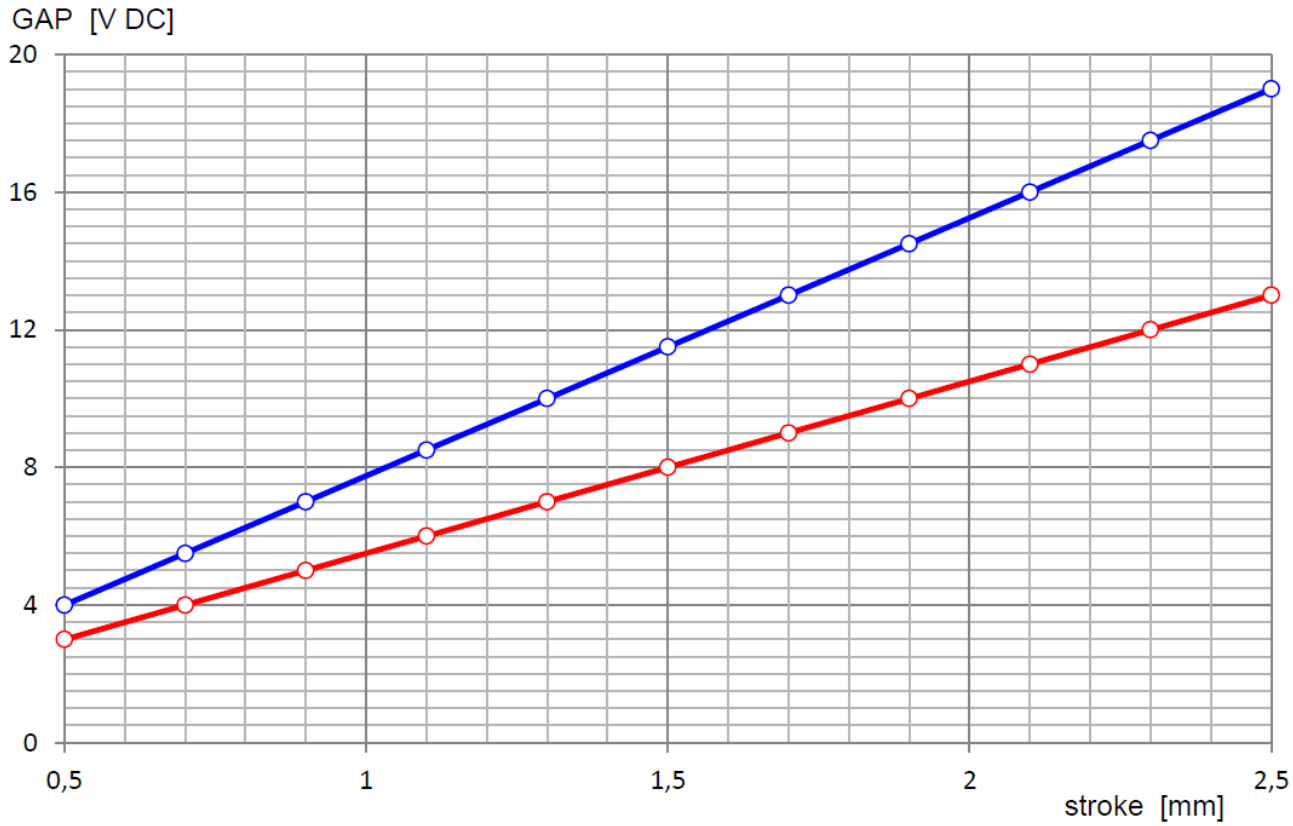
Sensitivity: 7,5 mV/µm



Viewing direction

☐ from driver

☑ to driver



Plant: _____ Date: _____

Machine: _____ User: _____

TAG-No.: _____ Company _____

5. Determining the loop sensitivity: When the probe is inserted until it reaches the bottom of the housing, a GAP voltage between 0.1 and 3 VDC is usually displayed. This value is to be entered at GAP distance = 0 mm.
6. Place the unit consisting of the probe and SensiChecker on a stable surface or hold it in your hand. Hold the probe and the adjusting ring firmly and then twist the housing to the left (CCW) from "click to click" or from one snap-in position to the next (each click alters the distance by 0.2 mm on type code "A1" or. 0.254 mm on type code "A2") and record GAP voltage after each "click".

The GAP between probe and target is adjusted with the SensiChecker "from click to click" in precise steps

Information on the setting accuracy

The commonly used static calibrators (micrometer screw, with reference material) provide a setting accuracy of approximately 5 µ. The 200 µ steps of the SensiChecker provide a setting accuracy of < 0.5 µ!

Do not try to measure the distance changes from "click to click" by eye with the aid of a sliding caliper; measurement inaccuracies would be inevitable!

ca. 5,0 µ

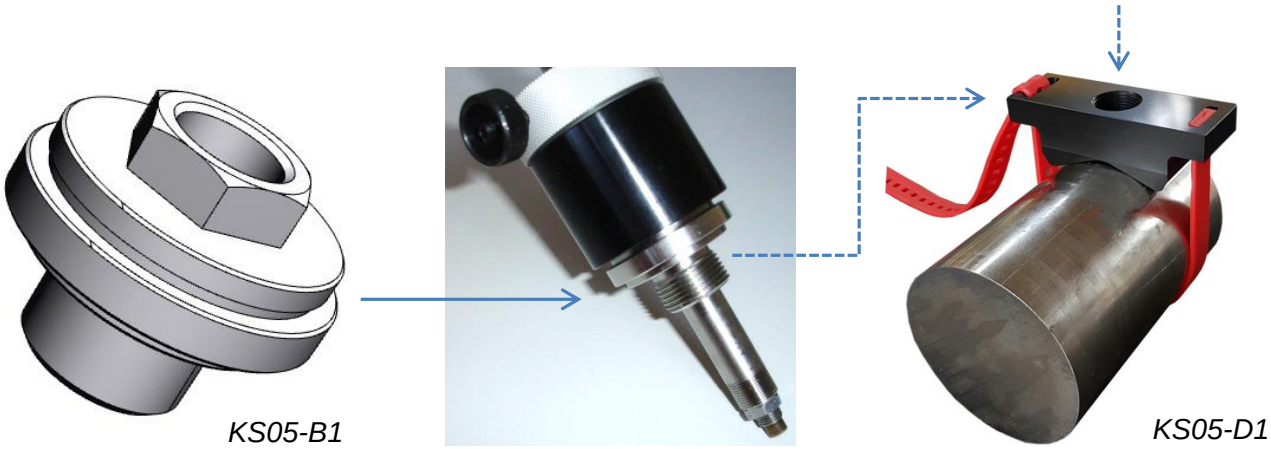
< 0,5 µ

7. If the aforementioned EXCEL form provided online is used, the diagram is automatically created and the sensitivity is displayed within the range of the typical operating setting (10 V).

4.3 Testing at the original measuring point

If the rotor material should differ from the reference material, neither the operating display nor the limit setting is correct. In order to establish a correction factor, the loop sensitivity has to be determined by carrying out a "probe against rotor" measurement.

The Adapter Screw KS05-B1 is designed for mounting the SensiChecker at the original measuring point. The Prismatic Shaft Adapter KS05-D1 is designed for direct mounting the SensiChecker on the disassembled original rotor shaft.

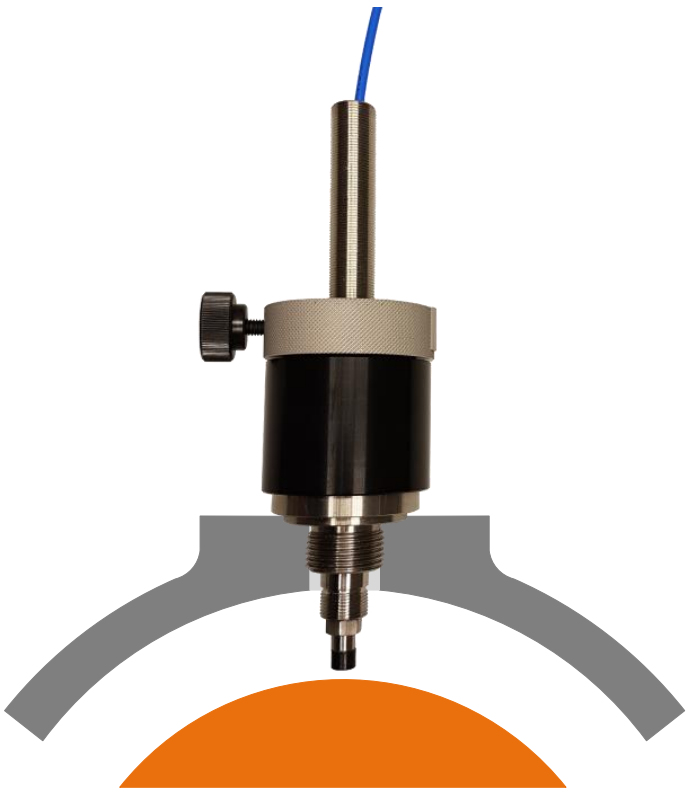


KS05-B1 *KS05-D1*

First replace the Target Screw at the bottom of the SensiChecker with the Adapter Screw.

Then screw the modified SensiChecker directly into the G3/4" threaded hole at the original measuring point. If there is a 3/4" threaded hole in the machine housing instead, you can use the Housing Adapter KS05-C1 in between. In case the rotor is even disassembled, fix the Prismatic Shaft Adapter directly on the shaft and screw the modified SensiChecker into the G3/4" threaded hole of the Prismatic Shaft Adapter.

Now follow the standard test procedure (4.2) accordingly.



Only by measuring with the original loop and against the original shaft material the sensitivity, which is relevant for correct status displays, can be determined absolutely reliable and with reasonable effort.

Correction factor = quotient of set sensitivity to actual sensitivity

Example:

Set sensitivity	8,0 mV/µ
Actual sensitivity	7,2 mV/µ
→ Correction factor K	1,11

→ An indication of 100 µ corresponds with a vibration of 111 µ