SERVICE NOTE

KLY5/MFK2 – High Noise, Zerroing Errors

Indications of the sensitivity problems

Typical indications of the Kappabridge sensitivity problems are high errors when you measure the samples, high error when empty holder is measured or zeroing errors through the measurements. If these problems are observed please try to perform following steps:

Suggestion for the proper installation of Kappabridge

Check the proper layout of your Kappabridge/CS system with respect to the figure 1. Keep the distance between electronic units and pick-up unit of Kappabridge as long as possible.
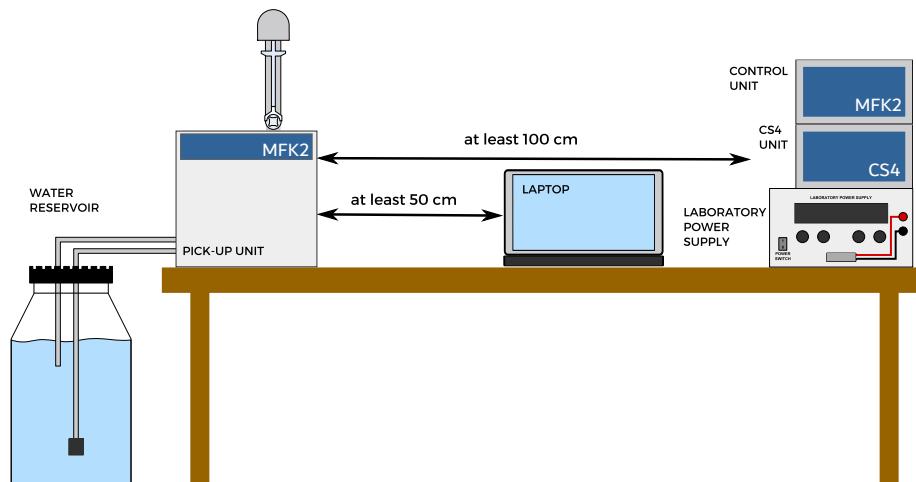

Figure 1: Recommended setup of KLY5/MFK2 + CS4 system

Place the apparatus to a room with relatively magnetically clean environment. It means that the instrument must not be placed near sources of alternating magnetic field, e.g. big transformers, electric motors, electricity power source wires, thermal sources etc. Do not place the pick-up coils near the other instruments or computer monitors.

Do not place the instrument near thermal and electrical sources and prevent the pick-up coils from direct sunshine. The pick-up unit must not be exposed to heat from the sun or from other sources, which would affect the precision of measurement. Do not place the instrument to a draughty room. Air condition may sometimes cause higher thermal drift of coils, prevent the direct air flowing in the room. The temperature

in the room should be stable as much as possible. The temperature variation in the room should not exceed 2 °C/hour.

Place the instrument and pick-up unit on a wooden table with good stability which has no iron part under working desk. It is recommended to place the pick-up unit on a separate stand or a small table which should be of such a height so that the middle of the pick-up unit coincides with the level of the working table. This arrangement makes the operation easier. During measurement prevent motion of magnetically objects (metal parts of chairs, doors, furniture, watches, rings, tools, components of your clothes, etc.)

Sensitivity tests

For the sensitivity tests start program Safyr. Then disable rotator and up/down mechanism using `Auxkey2` in Auxiliary command menu. This setting must be used for the simple test as well as for the Sigma test.

Simple test of the sensitivity can be performed as the measurement of the empty holder. Use function key F4 in the Auxiliary menu for running the Holder correction routine. When the routine is running do not insert holder into the measuring coil, just let the routine run. Check the results of the measurement. Standard error should not exceed $100{\times}10^{-9}$ SI for frequency 1.

Sigma test is the complex test of the Kappabridge sensitivity Be sure that the rotator and up/down mechanism are disabled. Do not disturb test measurement by moving anything in the vicinity of instrument. The temperature in the room should be also stable. Then use Function Key F2 (Auxkey 2) in Auxiliary menu for starting the Sigma test. This routine executes the set of test measurements with standard error evaluation. The data are stored in the files which names are derived from current time in format HHMMSS with extensions K00 and R00. The file K00 contains the all measured data, file R00 contains only the average and standard error of 10 repeated measurements in one set. Number of sets is also 10. The measurements take approx. 40 min.

SAFYR 7 or higher (can be downloaded for free from our web pages) also contains Sigma test. Test can be found in the menu Execute/Sigma test. Data are saved in *.csv files in the directory C:/Safyr7/Sigma test. Resulting value of the Std Error for MFK2 of the real part of susceptibility should be lower than $20{\times}10^{-9}$ SI for Frequency 1, lower than $60{\times}10^{-9}$ SI for Frequency 2 lower than $120{\times}10^{-9}$ SI for Frequency 3. KLY5 have only one frequency, so the Std error of Sigma test should be lower than $20{\times}10^{-9}$ SI.

You can check the results of the sigma tests by yourself, but it is highly recommended to send results of the both tests for analysis in the AGICO company (this analysis is free of cost).

How to solve problem with interference

1. Make sure that rotator is clean and up/down mechanism as well. If necessary clean them

2. Make sure of proper distance of the pick-up unit and control unit of the KLY5/MFK2 and distance of the wall and metal constructions

3. Check the near proximity of the Kappabridge, if there are not any sources of electromagnetic

    · disturbances like AC and thermal demagnetizers,
    · air condition units
    · voltage stabilizers and UPS,
    · modern electroluminescent lamps,
    · mobile phones
    · display unit
    · local area network (LAN)
    · To be sure switch them all off. Check also power sockets (proper contact) and connect KLY5/MFK2 through Belkin adapter.

4. Make sure that the next room beyond the wall is free such sources as well.

5. Make sure that the Kappabridge is placed on wooden table without metal loops and without any mechanical vibration and without blowing air close pick-up unit

6. Make sure that there is constant temperature and humidity in the laboratory. If not wait until temperature and humidity is in proper range and stable.

7. Close the windows to prevent blowing air.

If necessary move and install KLY5/MFK2 on different place and switch off all suspicious sources of interference.

After these steps return to measuring sensitivity and compare with previous values to check if changes of position helped.