

# SOP for Periodic Temperature Calibration of Moisture Analyzers

**Title:** SOP for Periodic Temperature Calibration of  
Moisture Analyzers

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## Controls

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## General

To test the heating unit of a moisture analyzer, the dedicated temperature calibration kit of the manufacturer must be used. During a temperature calibration the temperature calibration kit simulates the sample surface with a black disk (maximum radiation absorption). The temperature of the real sample during a measurement depends on its absorption characteristics and may differ from the temperature as measured on the black disk. For standardized and repeatable calibration or adjustment of temperature the temperature calibration kit has to be used.

### Basic Rules for Handling Moisture Analyzers

- Before using a moisture analyzer, make sure the instrument was left on power for a sufficient period of time (mentioned in the user manual).
- Minimize environmental influences, e.g. air drafts, vibrations or direct sunlight.
- The routine test should be performed at place of user under working conditions.

### Basic Rules for Handling Temperature Calibration Kits

#### Important to know

- Only a temperature calibration kit with calibration certificate can make the heating unit of a moisture analyzer a traceable piece of equipment.
- Temperature calibration kits should always be placed gently on the moisture analyzer and put back in their storage place after cooling down.
- Temperature calibration kits (since they are also part of measuring equipment) need to be re-calibrated at specified intervals (ISO 9001).
- Any damage, which might have affected the temperature calibration kit, should trigger an immediate re-calibration. METTLER TOLEDO's calibration services will give advice on this.

#### How to Store Temperature Calibration Kits

- Temperature calibration kits should be stored in their original box

#### How to Handle Temperature Calibration Kits

- Temperature calibration kits should only be hold on its handle.
- The kit consists of the black disc and the handler, the handler is always required for the temperature calibration or adjustment. HX/HS temperature calibration kit does not have a handler.
- Do not scratch the surface of the black disc or apply any sticker on the temperature calibration kit.

## Temperature Calibration

### Preparation

- When the test is performed, the moisture analyzer and the temperature calibration kit should be at room temperature.
- Make sure that the sensitivity test (if applicable) is performed before the temperature test to avoid long cooling down time.

## Test Procedure

- Start the test of the heating module according to the description in the operating instructions, this can be a 1-point-calibration up to a 3-point calibration (depending on the instrument type) and desired test. Typically, it is a 2-point calibration at 100 °C and 160 °C.
- Remove the sample pan and the sample pan holder.
- Place the temperature calibration kit together with the handler (if applicable).
- Start the temperature calibration.
- Read stable value(s)
  - Read value(s) when instrument asks to read the temperature and note it (them).
  - For HX/HS the temperature reading is automatically done by the instrument.
- HB or MJ moisture analyzers do not have a calibration (test) function – only adjustment. To be able to perform a calibration, start an adjustment, note the values and after the last calibration point at 160 °C do not confirm the values and simply open the lid, this will abort the adjustment.

## Evaluation

- Apply corresponding correction value from certificate if existing.
- Evaluate whether the noted value exceeds the defined “Warning Limit”. <sup>1)</sup>
- Evaluate whether the noted value exceeds the defined “Control Limit”. <sup>2)</sup>

## Deviation

### **Warning Limit** <sup>1)</sup> (where defined)

- If the warning limit is exceeded, repeat the test (after cooling down of the moisture analyzer).
- If the warning limit is exceeded again, report that the warning limit was not met to the laboratory supervisor or the person responsible for the moisture analyzer.
- Let the moisture analyzer cool down, perform temperature adjustment, let the moisture analyzer cool down, repeat the test.
- If the warning limit is still exceeded, report the problem to the laboratory supervisor or the person responsible of the moisture analyzer. Optionally, contact METTLER TOLEDO’s service organization for advice.

### **Control Limit** <sup>2)</sup>

- If the control limit is exceeded, report the problem to the laboratory supervisor or the person responsible of the moisture analyzer.
- Mark the moisture analyzer as “out of control limits”.
- Contact METTLER TOLEDO service organization for advice.

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<sup>1)</sup> – Values within the warning limit: no action is necessary.  
– Values between the warning and control limit are within the tolerance but must be kept under surveillance.

<sup>2)</sup> – Values within the control limit, see <sup>1)</sup>  
– Values beyond the control limit show that weighing process is no longer under control and immediate action is therefore required.

## Recommended Warning and Control Limits for Temperature Calibration

| <b>Moisture Analyzer</b> | <b>HX/HS</b> | <b>HR/HG</b> | <b>HB/MJ</b> |
|--------------------------|--------------|--------------|--------------|
| Warning Limit            | ± 3 °C       | ± 3 °C       | ± 3 °C       |
| Control Limit            | ± 5 °C       | ± 5 °C       | ± 5 °C       |

Recommended temperature calibration kits:

HX/HS: certified temperature calibration kit, Art. No.: 30020851

HR/HG/HB/MJ: certified temperature calibration kit (HA-TCC), Art. No.: 00214528

[www.mt.com/moisture](http://www.mt.com/moisture)

For more information

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Subject to technical changes

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