

Injection probe GSF38

for resistive material moisture measuring devices with BNC connector

Safety Instructions

This device has been designed and tested in accordance to the safety regulations for electronic devices.

However, its trouble-free operation and reliability cannot be guaranteed unless the standard safety measures and special safety advises given in this manual will be adhered to when using it.

Risk of injury! Only use this injection probe extremely carefully. Keep it out of reach from children.

Intended purpose: The injection probe is only for measuring bales, bulk cargo or similar, like, for example splints, wood chips, insulating material, straw, hay, etc.

This probe can be connected to resistive moisture measuring devices (e.g. GMH3830, GHH91 with BNC/RCA adapter).

Operating And Maintenance:

- Treat the injection probe carefully (do not throw, hit against etc.). Protect plugs and sockets from soiling.
- When disconnecting the cable from the socket (5) do not pull at the cable but on the plug. For locking and unlocking the movable ring has to be turned in its according direction. When having attached the plug right, it can be connected or disconnected gently without effort.
- The plastic insulator (3) has to be clean and dry in the range of the sensor pike, when not, faulty measurements may occur.
- Only use original cable! Otherwise faulty measurements are possible!

Generals for measurements

The resistance of the medium between the conical metal surfaces (1) and (2) is measured. The medium being measured has to be compressed well.

The best is, having a constant pressure onto the medium during the measurement. Do not release during the measuring, otherwise the contact to the medium can be interrupted, in this case a too dry value would be measured.

It is better to repeat the measurement a few times for having best results: the highest value measured is the most exact one. The measurement of wood chips or things like that is depending on temperature. For an exact measuring result the temperature of the medium has to be considered. This is done, depending on the device connected, with a corresponding temperature-compensation: (The GSF38 itself does not measure the temperature!)

- With external temperature probe: This should reach the temperature of the medium before measuring.
- With internal temperature-compensation: the device should reach the temperature of the medium.
- With manual temperature-compensation: enter exact temperature of the medium on the device.

Different measuring results are depending on different types of wood: Select correct wood-group or wood-type before measuring. Refer to operation manual of the connected measuring device. When pushing in the probes, oscillating movements have to be avoided. Otherwise hollows between the probes and the material may falsify the measurement.

Measuring bales of straw and hay bales:

Always inject the electrodes from the plain side of round bales never from the round side, the probe can be inserted much easier.

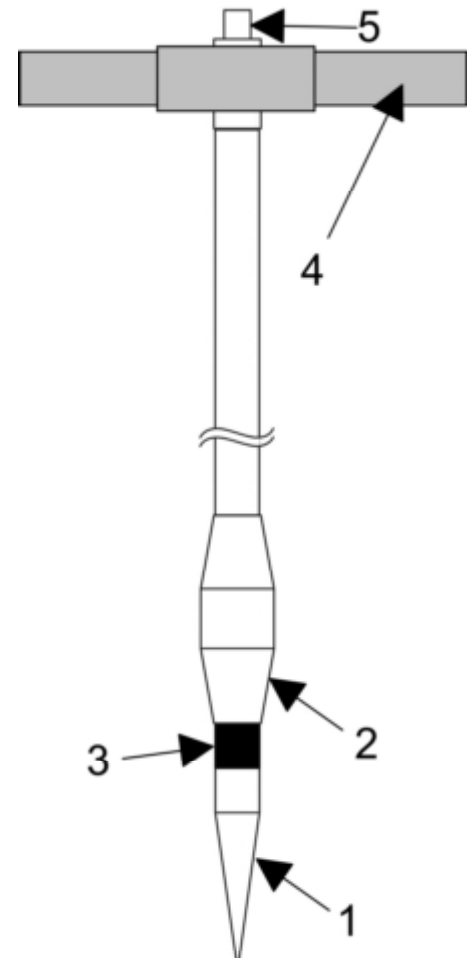
Technical Specification

Meas. principle Resistive material moisture measurement.

Connection BNC (cable included in scope of supply). For connecting devices with RCA connector an adapter has to be used.

Dimensions shaft \varnothing 15mm, contact surface 2: \varnothing 25mm, overall length 111 cm, max meas. depth ca 98 cm
short type: overall length 46 cm, max meas. depth ca 33 cm

Weight ca. 560 g, short type: ca. 210 g



Wood Chips as fuel

Especially when measuring wood chips it is necessary to have a continuous pressure of the measuring surfaces on the material. Do not release probe handle, otherwise the contact can be interrupted and a dryer value than the real one would be measured.

A sufficient compression of the material can be realized by stepping with the foot on the measuring site, or by measuring in a separate bucket, in which the material could be compressed easier.

Instrument settings for measuring wood chips:

GMH3830/3850 Version >= 1.5: **h.461 (specialised GSF38 curve**, also suitable for MC above 30%)

others: We recommend "Wood group C" (GMH38x0 instruments: "h. C"). This group delivers a sufficient accuracy for the fuel application up to 30% MC.

Wood chips are classified in different quality groups.

The size and the moisture content (MC or u) or the wet-basis moisture content (w) are the measure for the usability.

Usually a moisture content (w) of maximum 30% is recommended.

Chip size

Class		Size
G 30	small chips	smaller than 3cm
G 50	mid size chips	3 - 5cm
G 100	crude chips	5 - 10cm

moisture content

Class		Wet basis moisture content w (can be displayed directly of GMH3830 V1.4)	moisture content u (instrument's display e.g. of GMH3830 <V1.4)
w 20	air dry	<20 %	<25 %
w 30	storeable	20 – 30 %	25 – 43 %
w 35	conditionally storeable	30 – 35 %	43 – 54 %
w 40	wet	35 – 40 %	54 – 67 %
w 50	fresh cut	40 – 50 %	67 – 100 %

The higher the moisture content, the lower is the heating value per weight!

Older instruments (e.g. GMH3830 before V1.4) cannot be switched from moisture content u to w, in this case the wet basis moisture content can be calculated like following:

Conversion meter display u -> wet-basis moisture w

$$\text{wet-basis moisture } w[\%] = 100 * \text{Moisture content } u[\%] / (100 + \text{Moisture content } u[\%])$$

Examples: 1kg of wet wood, which contains 500g of water has a moisture content u of 50%
1kg of wet wood, which contains 200g of water has a moisture content u of 20%

Conversion moisture content u - wet-basis moisture content w

