TOOLTUFF TECH

Hay Moisture Tester

HP 1

SKU: 26-253

User's Guide

Rev. A - 02/2025

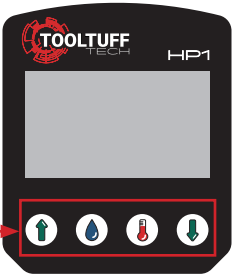
Getting Started

Installing batteries

Remove the battery door on the back of the tester and install 4 AAA batteries (included). Align the polarity as indicated. For the best battery life, use alkaline batteries and replace all 4 batteries every time. Use the battery indicator to track battery life:

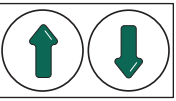
Powering up

Press any button to power up the unit. There is no on/off switch. You can power down the unit by pressing the “up” and “down” arrow buttons simultaneously and holding briefly. The moisture tester will automatically turn itself off after 4 minutes if no button is pressed.



Press any button to power up the device.

Note: To power down the moisture tester, press and hold the “up” and “down” arrows at the same time.



Software

Checking the Software Version

When powered up, the tester initially displays “U*x.x*”. This indicates the software version the tester is running. In the example below, the tester is running version 1.1.

Example: Display shows tester is running software version 1.1

Checking for Software Updates

To check for the latest software update, scan the QR code below, or open your web browser and go to:

https://www.tooltuffdirect.com/pages/moisture-tester-hp1-support

There you can compare the latest software release to the version your unit is running. New functionality may be added to the moisture tester through software updates in the future. Instructions for updating the software can be found on the web page (above), and on page 12 of this manual.

Moisture Testing

Measuring moisture

Moisture button

Press the moisture button:
Once pressed, the display shows the current moisture reading.

The display shows < 8.0% when the probe is in the "open air" (i.e. - when the probe tip is not inserted into a hay bale). If the moisture level in a hay bale is below 8%, the display will continue to show < 8.0%, as in the example below. (Note that 8% is the minimum reading of which the probe is capable.)

Example: Display shows < 8.0% when probe tip is in open air.

Note: If the probe tip is in open air and the display **does not** read < 8.0%, this may indicate a dirty probe tip. Use some fine steel wool to polish the tip and remove any residue from it.

Moisture readings

Understanding moisture readings and range:
The tester is capable of reading hay-moisture levels between 8.0 and 45.0%. However, **the tester is most accurate within the range of 10.0 and 25.0%**. Readings above 25.0% may vary by +/- 1%, and indicate a very high moisture level rather than an absolute reading.

The minimum reading for moisture is 8%. Below that, the display shows "less than."

Example: Display shows moisture level is "less than 8.0%."

When the hay is above 45% moisture, the display shows > 45.0%, as in the example below.

The maximum reading for moisture is 45%. Above that, the display shows "greater than."

Example: Display shows moisture level is "greater than 45.0%."

Note: If the tester reads > 45.0% while the probe is in open air, this may indicate a shorted probe tip. See pages 8 and 9 of this manual for information about testing the validity of moisture readings. **The probe can be replaced by the user.** Visit our moisture tester support page (see link above) for instructions on replacing the probe tip.

Temperature

Measuring temperature

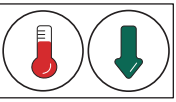
Temperature button

Press the temperature button:
Once pressed, the tester displays the current temperature reading. The tester can display readings in degrees Fahrenheit or Celsius.

Example:
Display shows a temperature reading in degrees Fahrenheit.

Example: Display shows bale temperature is 72° Fahrenheit.

Note: To switch between degrees Fahrenheit and Celsius, press the "temperature button" and the "down arrow" at the same time.



Temperature range

Temperature range: 32-212° Fahrenheit:
The moisture tester is capable of producing an accurate temperature reading within the range of 32° Fahrenheit (0° C) and 212° F (100°C).

Temperature readings

How to take an accurate reading:
The temperature throughout a single bale can vary, so it's important to take readings in various locations. When probing the bale, **ensure the probe has time to reach the temperature of the hay inside**—the temperature reading is not instant. Always wait a few moments to see that the temperature has stopped changing. If a bale's internal temperature varies widely, then the temperature reading on the display will change fairly quickly when the probe is inserted.

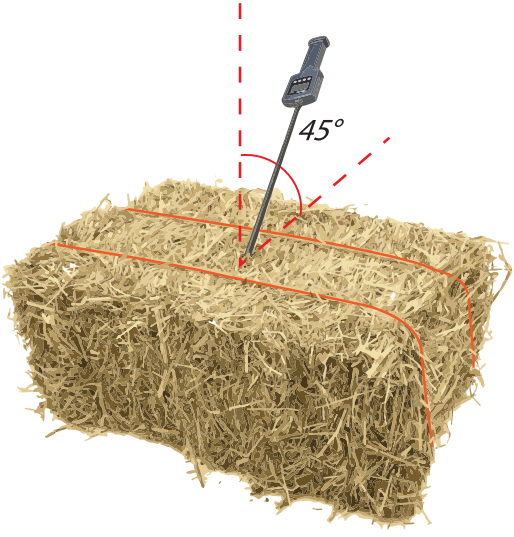
Taking Accurate Readings

Methods for taking accurate readings:
The tester is designed to measure the hay while in bale form; it is not designed to be used with hay still in the windrow. Review the diagrams below for some probing techniques for the various bale types.

Moisture content and temperature can vary throughout a single bale, so it is important to **take at least 5 readings** at various locations within the bale. Always **use the highest readings as a guideline** for determining the bale's moisture: never average the readings. Readings should only be taken once the probing motion has stopped and the display shows a stable reading.

Rectangular Bales

Probe the densest areas: small rectangular bales are denser towards the bottom or "tight" side, and large rectangular bales are the densest in the upper corners.

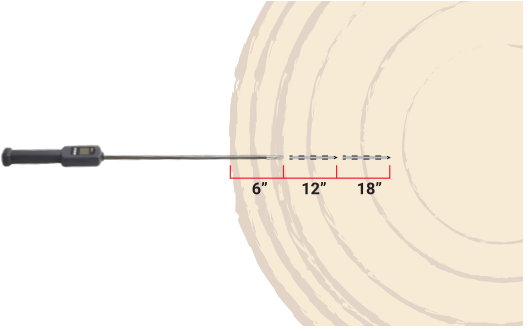


Example: Insert the probe tip at a 45º angle. Search for the densest, most tightly packed sections of the bale for the highest accuracy.

Round Bales

Insert the probe towards the center of the bale, and space out your probing points generously.

Example: Insert the probe tip pointing toward the center the round bale. Space out the samples by at least 6 inches, preferably more, and never probe the same location twice.



Example: Insert the probe tip at least 6 inches, take a reading, then insert to a depth of 12 inches, and again at 18. Using this method you can take 2-3 reading at each probe location.

Consult your local agricultural extension office for recommended baling-moisture levels and bale storage in your region. Most will agree that hay should not be baled or stored over 20% moisture without the use of preservatives, and that hay over 25% is not suitable for storage, even with preservatives.

More information:

Moisture testing variables

Factors that affect readings:
Bale density: in general, a higher density bale *of the same moisture level* will produce a higher reading than a lower density bale. Compaction of the hay varies within each bail, and various measurements should be taken to locate the densest areas of a given bale.

Each brand of bailer feeds hay into its chambers differently, and there are differences between bailers, but generally the above guidelines hold true.

Natural variations within the plant before curing: Generally speaking, the higher the moisture content, the wider variation of readings the tester will produce. Greater uniformity can be expected as more curing takes place.

Sweating: Higher readings may occur during the first couple of days after bailing. Immediately after bailing, moisture readings may be low and then climb during the "sweating" process. As the hay cures, moisture readings will drop and continue to decline as the hay becomes progressively dryer. It is important to continue to monitor moisture as well as temperature for several days.

Use of preservatives: Some preservatives increase conductivity initially. Until the preservative is absorbed (usually in 1-2 days), it may cause moisture readings to be 2-4% above the level of the same hay when untreated.

Percentage of grass in the hay: This tester has been calibrated on 100% alfalfa hay. The more grass there is in the hay, the higher the moisture reading is compared to the actual level.

Important: Because there are numerous variables which can affect moisture-tester readings, the moisture content indicated should not be taken as an absolute quantitative measurement. **Your tester's readings are useful guidelines for safely storing baled hay.** We always recommend taking a core sample and preforming additional analysis based on your hay type and condition.

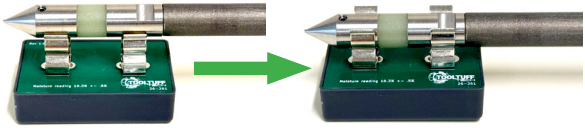
Tester Verification

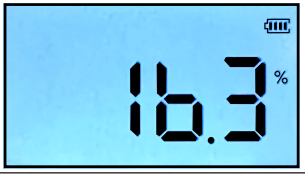
Verifying the validity of your readings:
Before testing hay-moisture levels, verify that your tester is producing accurate readings. Your tester includes a verification clip for checking your tester's readings quickly and easily.

Verification clip

Step 1: Power up the tester and press the moisture button. The display should read <8.0%; if it doesn't, clean the tip with a piece of fine steel wool.

Step 2: Next, snap the verification clip onto the tester as shown below, with one steel section of the probe touching each side of verification clip. Give the tester a few moments to stabilize. The tester should give a reading of 16.3% +/- .5.





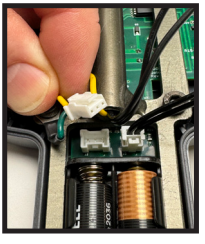
Example: Display shows moisture level is 16.3% when attached to verification clip.

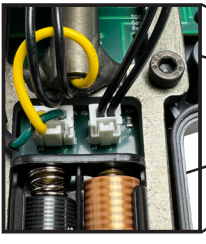
Testing the Verification Clip

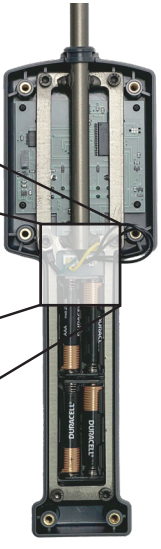
What to do if the clip does not display 16.3% +/- .5:
If the tester still reads < 8.0% with the clip attached, then put your bare hand over the tip and see if the reading changes. There are 2 possible outcomes:

1. The reading does not change. In this case, open the back of the tester and check the internal probe connection, as shown below. If loose, re-connect the probe and try the verification clip again.

2. You get a reading with your hand (but not with the clip): The clip is faulty and needs to be replaced.







Example: Checking the yellow, 3-pronged moisture probe connection.

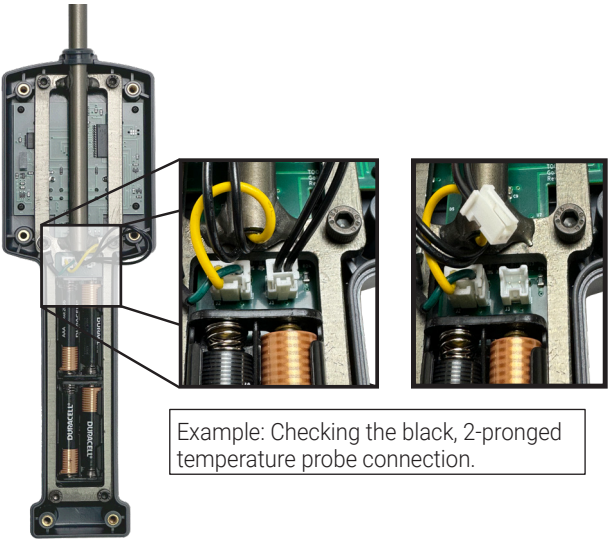
If the tester reads greater than 16.3% +/- .5 with the clip attached, then try cleaning the tip and re-testing. If that doesn't work, the internal circuit board may be faulty. Visit our website to purchase a replacement circuit board, and for instructions on replacing the board.

Troubleshooting

Common issues and fixes:

Temperature reading is inaccurate

If the temperature reading is way off from the ambient temperature: then open up back of the housing and check the black temperature probe connection, as shown below.



Example: Checking the black, 2-pronged temperature probe connection.

If the connection is good but the temperature reading is still off, the probe may need to be replaced.

Note: If temperature readings appear to be off, it is possible that the circuit board is faulty. However, the simple, robust design of the board is very reliable. For this reason, changing out the probe is the most likely solution to temperature-reading issues *unless you have a specific reason to suspect the circuit board*.

Display suddenly or unexpectedly shows ‘USB connected’

Sometimes, if the device is dropped or knocked, the screen may show that a USB device is connected (see below). If the display goes into this mode, there are two ways to fix it: 1) wait :30 seconds for the display to return to normal; 2) if you prefer not to wait, remove the batteries then put them back in. The device will reboot in normal operating mode.

Example: Display shows USB device is connected

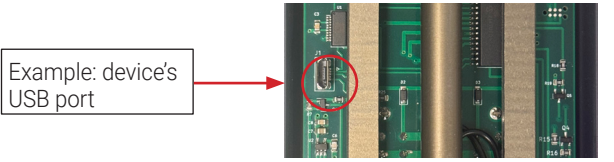
Updating the Software

To update the software, open your browser and navigate to:

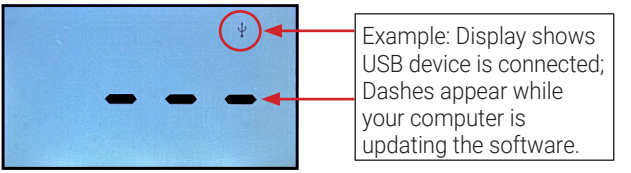
https://www.tooltuffdirect.com/pages/moisture-tester-hp1-support

Note: A Microsoft Windows operating system is required to update the software. Other operating systems are not supported at this time.

Open up the back of the housing and locate the USB port:



Use a micro-USB cord to connect the computer to the moisture tester. The screen display should show 'USB device connected':



First, check which software version your device is currently running (see: *Software*, p.1 for instructions). If your version is not the most up-to-date available, download the "H1 Software Update U*x.x*.exe" file from our web page (address above).

Once downloaded, locate the software update on your computer and open it. Your computer may give you a warning, "unknown publisher" or similar; click '**more info**' and '**run anyway**'. It will not harm your computer in any way.

The program will install an icon on your desktop (or other specified location). Double click the ToolTuff icon to open. Once open, connect the moisture tester to the computer with your micro-USB cord, and click the "update" button. The program will locate the moisture tester on your computer and update the software. You should see 3 dashes appear on the screen of the tester while the software is being updated. Once the moisture tester's display goes back to < 8.0%, you can unplug it from your computer. The software update is complete.

Tips

To keep your tester in good working order:
Transporting and Storage: Store the moisture tester in the carrying case when not in use. The case is designed to protect the tester from impacts and extreme temperatures, as well as to store replacement parts and batteries.

Batteries: Remove the batteries from the tester when storing for long periods. It's a good ides to keep some replacement batteries in the case. Note that if the tester experiences an impact whether from a knock or a fall, the batteries may come loose. If the unit wont turn on after an impact, check the batteries first.

Weather: Do not leave the moisture tester exposed to weather or extreme temperatures as it could damage the unit.

Repairs: The HP1 moisture tester is designed to be durable and reliable. It is also designed so that you, the owner, can make repairs if needed. If you leave your moisture tester out in the cold rain and the motherboard is damaged, it's an easy fix. You can order parts and do the replacement yourself. You can find how-to videos for replacing the probe and the motherboard on our website, ToolTuffDirect.com, and replacement parts are available there for purchase as well.

Tools: Use the carrying case to keep spare parts and tools. A size 3 metric Alan wrench is included. A micro USB cable (not included) is required to perform the software update. A #0 Philips head screwdriver (not included) is needed to replace the circuit board.

Note: A micro-USB cable (not included) is required to connect the moisture tester to your PC. Make sure your micro-USB cable supports both data and power—some only support power.

Product Support

For more information:
Please visit our website support page for the latest troubleshooting tips and repair guides. For further assistance, call or email our technical support staff or customer service department. Replacement parts can be purchased at our website; contact us by phone or e-mail for warranty issues or to place an order. See our contact details below.

https://www.tooltuffdirect.com/pages/moisture-tester-hp1-support

Questions? For service call or e-mail:
720-437-7640
customerservice@tooltuffdirect.com
techsupport@tooltuffdirect.com
or visit:
www.tooltuffdirect.com

NOTES

Warranty Registration by Mail

To register your device:

1. Fill in the form below;
2. Cut out the form, attach a copy of the receipt or proof of purchase;
3. And mail to:

ToolTuff Direct
15000 West 44th Ave.
Suite B
Golden, CO 80403

WARRANTY REGISTRATION FORM

HAY MOISTURE TESTER (SKU 26-253)

* Device Serial #:

Purchase date:

Purchased from

(Store / City):

Purchaser's name:

Purchaser's street address:

City:

State:

Zip code:

Purchaser's phone:

E-mail:

* Device serial number can be found underneath battery door.

Warranty Information

Warranty and Registration

ToolTuff Tech offers a two-year limited warranty against defects in workmanship and functionality of the HP1 moisture tester. This warranty gives the consumer certain and specific rights which may vary from state to state.

The warranty does not cover normal wear, misuse, neglect, abuse, improper care, accidents, cosmetic defects, unauthorized replacement parts or accessories, or unauthorized software changes.

The warranty may be refused if the registration is not completed, signed, and legible. It is the responsibility of the purchaser to assure that the registration form is completed and submitted. For the best customer service experience, register your device within two weeks of date of purchase.

IMPORTANT NOTICE
We, the manufacturer, reserve the right to change the product and/or specifications in this manual without notification. The manual is for information use only and the pictures and graphics depicted herein are for reference only.

Warranty Repair and Service
Do not return this product to the store for warranty issues or repair. Call our customer service department at 720-437-7640 for the warranty claims, parts, and more information.

Warranty Registration by Online Submission

Registration may be completed by following the QR code below. Use the camera app on your smartphone in the same manner you would if you were taking a photo. Your smartphone will recognize the code, and a link will appear on the screen. Tap the link and you will be directed to the form on our website.

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for Replacement Manual
SKU: 26-262