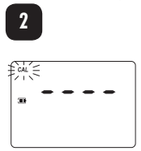
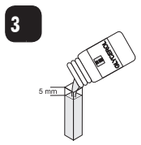
MEASUREMENT PROCEDURE

Measurement ▼

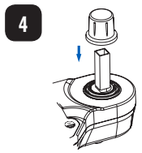
1• Turn the meter on by pressing **ON/OFF**.



2• When the beeper sounds briefly and the LCD displays dashes, the meter is ready. The blinking **"CAL"** indicates that the instrument needs to be calibrated first.



3• Fill one cuvette with 4 mL of Glycerol, up to 5 mm (0.2") below the rim. This is the Glycerol Standard Reference.

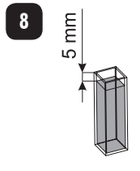


4• Place the cuvette into the holder paying attention to the direction of the light indicated by the arrow on the instrument. Then put the light shield cap on and ensure that the notch on the cap is positioned securely into the groove.

5• Press **CAL** and the lamp, cuvette and detector icons will appear on the display, depending on the measurement phase.

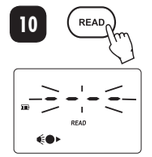
6• After a few seconds the display will show **"-0.0-"**. The meter is now calibrated and ready for measurement.

7• Remove the cuvette.



8• Add to a second clean cuvette about 4 mL of honey, up to 5 mm (0.2") below the rim. This is the sample.

9• Place the sample cuvette into the holder paying attention to the direction of the light indicated by the arrow on the instrument. Then put the light shield cap on and ensure that the notch on the cap is positioned securely into the groove.



10• Press **READ** and the lamp, cuvette and detector icons will appear on the display, depending on the measurement phase.

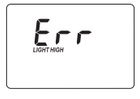
11• At the end of measurement, the instrument directly displays the honey color intensity value expressed in mm Pfund, as compared to analytical grade Glycerol (fixed at zero mm Pfund).

INTERFERENCES

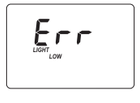
Interference may be caused by air bubbles or turbidity in the sample. Scratched or dirty cuvettes will also affect readings. Always check clearness of cuvettes prior to use.

ERRORS AND WARNINGS

On Calibration Reading



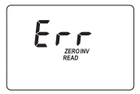
Light High: There is too much light to perform a measurement. Please check the preparation of the calibration cuvette.



Light Low: There is not enough light to perform a measurement. Please check the preparation of the calibration cuvette.

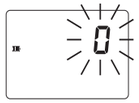
No Light: The instrument cannot adjust the light level. Please check that the calibration cuvette does not contain any debris.

On Sample Reading:



Inverted cuvettes: The sample and the calibration cuvette are inverted.

CAL: A calibration reading was not taken. Follow the instructions of the measurement procedure for calibrating the meter.



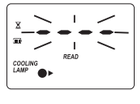
Under range: A blinking **"0"** indicates that the sample absorbs less light than the calibration reference. Check the procedure and recalibrate the instrument.

Over Range: A flashing value of the maximum concentration indicates an over range condition (on both wavelenghts). The concentration of the sample is beyond the programmed range.

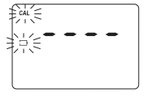
A flashing value lower than the maximum concentration (e.g. **"120"**) indicates an over range condition on one wavelenght. The displayed concentration value (e.g. **"120"**) is the reading obtained on the other wavelenght.

Other Errors and Warnings:

Cap error: Appears when external light enters in the analysis cell. Assure that the light shield cap is present.



Cooling lamp: The instrument waits for the lamp to cool down.



Battery low: The battery must be replaced soon.

Dead battery: This indicates that the battery is dead and must be replaced. Once this indication is displayed, normal operation of the instrument will be interrupted. Change the battery and restart the meter.

BATTERY MANAGEMENT

To save the battery, the instrument shuts down after 10 minutes of non-use in measurement mode and after 1 hour of non-use in calibration mode.

If a valid measurement was displayed before auto-shut off, the value is displayed when the instrument is switched on. The blinking "ZERO" means that a new zero has to be performed.

One fresh battery lasts for around 750 measurements, depending on the light level.

The remaining battery capacity is evaluated at the instrument startup and after each measurement.

The instrument displays a battery indicator with three levels as follows:

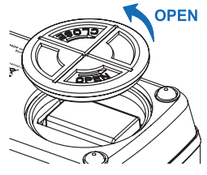
- 3 lines for 100 % capacity
- 2 lines for 66 % capacity
- 1 line for 33 % capacity
- Battery icon blinking if the capacity is under 10 %.

If the battery is empty and accurate measurements can't be taken any more, the instrument shows "dEAd bAtt" and turns off.

To restart the instrument, the battery must be replaced with a fresh one.

To replace the instrument's battery, follow the steps:

- Turn the instrument off by pressing ON/OFF.
- Turn the instrument upside down and remove the battery cover by turning it counterclockwise.



- Extract the battery from its location and replace it with a fresh one.
- Insert back the battery cover and turn it clockwise to close.

INSTRUCTION MANUAL

HI96785

Honey Color Analyzer

HANNA® instruments

Thank You

Thank you for choosing a Hanna Instruments product. Please read this instruction manual carefully before using the instrument.

For more information about Hanna Instruments and our products, visit www.hannainst.com.

For technical support, contact your local Hanna Instruments Office or e-mail us at tech@hannainst.com

Find your local Hanna Instruments Office at www.hannainst.com.

PRELIMINARY EXAMINATION

Please examine this product carefully. Make sure that the instrument is not damaged. If any damage occurred during shipment, please contact your local Hanna Instruments Office.

Each HI96785 Honey Color Analyzer is supplied complete with:

- Sample Cuvettes (5 pcs.)
- Light Shield Cap (1 pc.)
- 30 mL Glycerol (1 bottle)
- 9V Battery
- Instruction Manual and Quick Reference Guide

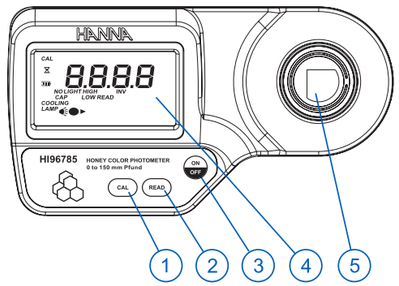
Note: Save all packing material until you are sure that the instrument works correctly. Any defective item must be returned in its original packing.

For more details about spare parts and accessories see "Accessories".

SPECIFICATIONS

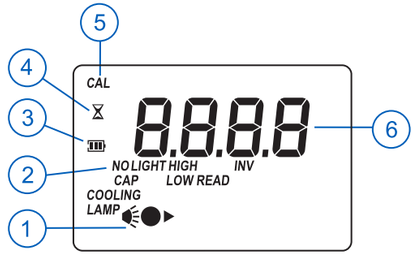
Range	0 to 150 mm Pfund
Resolution	1 mm Pfund
Accuracy @25 °C (77 °F	±2 mm Pfund @ 80 mm Pfund
Light source	Tungsten lamp
Light Detector	Silicon Photocell with narrow band interference filter @420 nm and 525 nm
Method	Direct Measurement
Environment	0 to 50 °C (32 to 122 °F); max 95% RH non-condensing
Battery Type	9V (1 pc.)
Auto-Shut off	After 10' of non-use in measurement mode after 1 hour of non-use in calibration mode with last reading reminder
Dimensions	192 x 104 x 69 mm (7.6 x 4.1 x 2.7")
Weight	320 g (11.3 oz.)

FUNCTIONAL DESCRIPTION



1. **CAL** key: press to calibrate the meter prior to measurement.
2. **READ** key: press to make a measurement.
3. **ON/OFF** key: to turn the meter on and off.
4. Liquid Crystal Display (LCD)
5. Cuvette holder

DISPLAY ELEMENTS DESCRIPTION



1) The measuring scheme (lamp, cuvette, detector), appears during different phases of calibration or reading measurement
2) Error messages and warnings
3) The battery icon indicates the charge state of the battery
4) The hourglass appears when an internal check is in progress
5) Status message
6) Four digit main display

GENERAL DESCRIPTION

The HI96785 portable microprocessor analyzer measures the percent light transmittance of honey compared to analytical reagent grade glycerol. The transmittance value allows identification of the honey Pfund grade. The instrument directly displays the measurement result expressed in mm Pfund.

Measurements are made using matched square optical cuvettes having a 10 mm light path.

Display codes aid the user in routine operations.

The meters have an auto-shut off feature that will turn the instrument off after 10 minutes of non-use.

SIGNIFICANCE AND USE

Honey color varies naturally in a wide range of tonalities, ranging from light yellow to amber, dark amber and black in extreme cases; sometimes green or red hues may also occur.

Color of untreated honey depends on botanical origin: for this reason color is very important for definition and commercial classification of monofloral honeys. Honey darkens with ageing, and other changes in color may result from beekeeper's interventions and from the different ways of conservation (e.g.: use of old honeycombs, contact with metals, high temperatures, exposition to light, etc.).

The primary characteristic for commercial honey classification is color. Color classes are expressed in millimeters (mm) Pfund grades, compared to an analytical grade Glycerol Standard Reference.

Table 1 reports the USDA classification for honey samples and the related mm Pfund values.

Table 2 shows the color of different monofloral honeys: data are obtained from a statistical set of honey samples. The table reports for each type of honey: average value of color, standard deviation, and the minimum and maximum values measured.

Table 1

USDA Color Standards Designations	Color Range Pfund Scales (mm)
Water White	≤ 8 or less
Extra White	> 8 - ≤ 17
White	> 17 - ≤ 34
Extra Light Amber	> 34 - ≤ 50
Light Amber	> 50 - ≤ 85
Amber	> 85 - ≤ 114
Dark Amber	> 114

Table 2

Honey Type common name	Latin name	AVERAGE (mm Pfund)	SD (mm fund)	Min. Value (mm Pfund)	Max. Value (mm Pfund)
Acacia tree	Robinia pseudoacacia	15	6	11	27
Chestnut tree	Castanea sativa	92	19	62	119
Citrus spp.	Citrus spp.	14	5	11	35
Dandelion	Taraxacum officinalis	54	11	41	71
Eucalyptus	Eucalyptus spp.	58	11	41	71
Fir honeydew		98	8	83	110
Fir tree honeydew		99	16	83	130
French honeysuckle	Hedysarium coronarium	18	6	11	35
Heather	Erica arborea	96	10	83	119
Lime tree	Tillia spp.	43	17	11	71
Rhododendron	Rhododendron spp.	13	5	11	27
Strowberry tree	Arbutus unedo	70	10	55	83
Sunflower	Helianthus annus	61	6	51	71
Thyme	Thymus spp.	52	16	27	83

RECOMMENDATIONS FOR USERS

Before using these products, make sure that they are entirely suitable for your specific application and for the environment in which they are used.

Operation of these instruments may cause unacceptable interferences to other electronic equipments, this requiring the operator to take all necessary steps to correct interferences.

Any variation introduced by the user to the supplied equipment may degrade the instrument's EMC performance.

To avoid damages or burns, do not put the instrument in microwave oven. For yours and the instrument safety do not use or store the instrument in hazardous environments.

ACCESSORIES

Analysis Kit	
HI93703-56	Honey Color analysis kit, containing 82 square cuvettes, 30 mL of Glycerol and two 5 mL syringe (75 tests average)
Other Accessories	
HI93703-57	Glycerol, 30 mL (4pcs.)
HI70662	Cleaning solution for honey meter, 30 mL
HI740226	5 mL graduated syringe
HI740029P	9V battery (10 pcs.)
HI731318	Cloth for wiping cuvettes (4 pcs.)
HI731335	Caps for cuvettes (4 pcs.)

WARRANTY

HI96785 is warranted for two years against defects in workmanship and materials when used for its intended purpose and maintained according to the instructions.

This warranty is limited to repair or replacement free of charge.

Damages due to accident, misuse, tampering or lack of prescribed maintenance are not covered.

If service is required, contact your local Hanna Instruments Office. If under warranty, report the model number, date of purchase, serial number and the nature of the failure. If the repair is not covered by the warranty, you will be notified of the charges incurred.

If the instrument is to be returned to Hanna Instruments, first obtain a Returned Goods Authorization Number from the Customer Service Department and then send it with shipment costs prepaid. When shipping any instrument, make sure it is properly packaged for complete protection.

To validate your warranty, fill out and return the enclosed warranty card within 14 days from the date of purchase.

IST96785 01/18