

Instruction Sheet

FT660 and FT660sc dry standard quick check verification

Safety Information

Please read this entire document before unpacking, setting up, or operating this equipment. Pay attention to all danger and caution statements. Failure to do so could result in serious injury to the operator or damage to the equipment.

Make sure that the protection provided by this equipment is not impaired, do not use or install this equipment in any manner other than that specified in this document.

	<p>Electrical equipment marked with this symbol may not be disposed of in European public disposal systems after 12 August of 2005. In conformity with European local and national regulations (EU Directive 2002/96/EC), European electrical equipment users must now return old or end-of life equipment to the Producer for disposal at no charge to the user.</p> <p>Note: For return for recycling, please contact the equipment producer or supplier for instructions on how to return end-of-life equipment, producer-supplied electrical accessories, and all auxiliary items for proper disposal.</p>
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General Information

This instruction sheet gives directions on how to use a dry standard to verify the calibration of a FilterTrak 660 sc or FT660.

This instruction sheet is divided into two main sections:

- Section 1 gives instructions on how to enable the dry standard software. It also gives instructions on how to do dry standard verifications with the software. This applies only to FT660 sc instruments.
- Section 2 gives instructions on how to do the general dry standard verification procedure on instruments (including the FT660 sc) that do not use the dry standard software. The procedure can be done on FT660 instruments that use the AquaTrend® controller by manually recording the baseline value, the pass / fail criteria, and the verification value.

Product Overview

The dry standard is based on the light scatter at very low turbidity levels and typically measures between 15 and 75 mNTU. It has an assignable range through 1000 mNTU. The value is very reliable when the dry standard is prepared and used as instructed.

Prerequisites

In order to use the dry standard, FT660 and FT660 sc instruments must be fitted with a special aperture plate. FT660 sc instruments can also be upgraded with software that automatically finds and stores baseline and verification values.

Instruments made before April 2008 can be retrofitted with the necessary aperture plate which can be installed by the customer. Refer to the instructions supplied with the aperture plate. Software upgrades must be done by a Hach technician.

Starting in April of 2008, the dry standard aperture plate and software will be installed on all FT660 sc laser turbidimeters at the time of manufacture.

Section 1 Verification of FT660 sc with dry standard and software

The FT660 sc software is designed to find and store a baseline value for the dry standard. A baseline value must be found after the initial calibration. This value will be referenced for subsequent verifications until the next calibration. When the instrument is recalibrated for any reason, a new dry standard baseline value must be found.

Note: When not in use, keep the dry standard in the protective case.

1.1 Enable the dry standard software

1. From the sc100 menu, choose **SENSOR SETUP**.
2. Choose the sensor for which the dry standard is to be enabled.
3. Choose the **CALIBRATE** option and then select **VERIFICATION**.
4. Choose **CVM SELECT** and press **ENTER**.
5. Choose **ENABLE** and press **ENTER**.
6. Press **ENTER** to return to the **CALIBRATION** menu.
7. Select **VERIFICATION, P/F Criteria** to set the Pass or Fail Criteria to a value other than the recommended default of ± 5 mNTU.

*Note: The P/F Criteria menu option appears only if the CVM is set to **ENABLE**.*

8. Use the arrow keys to adjust the PFC value and press **ENTER**. The allowable range is between 5 mNTU (the default value) and 250 mNTU.

1.2 Assign a baseline value to the dry standard

Note: Assignment of a baseline value can be done only after the instrument has been successfully calibrated.

1. Once a successful calibration has been done and the operator initials have been entered, the display shows **VERIFY CAL?** Press **ENTER** to begin the verification process.
2. Choose **DRY** for the verification type and press **ENTER**.
3. Remove the turbidimeter head. Refer to [Figure 1 on page 3](#).
4. Remove the dry standard from the protective case and record the serial number etched into the dry standard collar. Refer to [Figure 2 on page 4](#). The serial number must be entered to determine a baseline value.
5. Inspect the dry standard glass rod to make sure it is clean and free of chips and scratches. Clean the device with the disposable wipes provided.
6. Dry the top $\frac{1}{3}$ of the dry standard and the top surface. Refer to [Figure 2 on page 4](#).
7. Insert the dry standard into the aperture plate. Make sure the alignment pin fits into the notch. Refer to [Figure 2 on page 4](#).

8. Rotate the dry standard approximately $\frac{1}{8}$ of a turn to the right until the dry standard locks into position. Refer to [Figure 2 on page 4](#).
9. Dry off the remainder of the glass to remove any fingerprints and oils.
10. Place the turbidimeter head on the body. Make sure the head is correctly positioned and press **ENTER**.
11. Enter the digits of the dry standard serial number and press **ENTER**.
12. Allow the instrument reading to stabilize. Press **ENTER** to accept the reading as the baseline value.

*Note: The user does have the option to push **ENTER** before the reading becomes stable. However, this may cause inaccurate baseline values.*

13. Remove the dry standard, replace the head and press **ENTER** to continue to Measurement Mode. Place the dry standard back into the protective case.

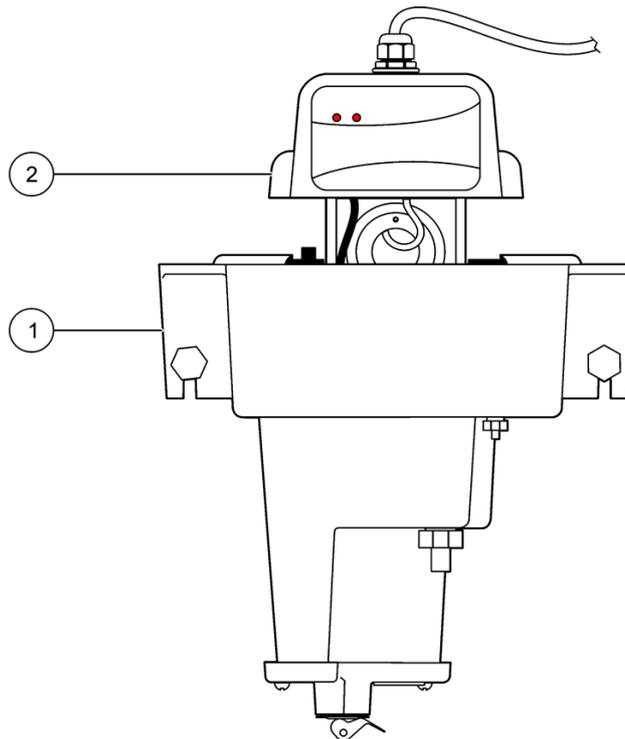


Figure 1 Remove turbidimeter head

1 FT660 body	2 FT660 head
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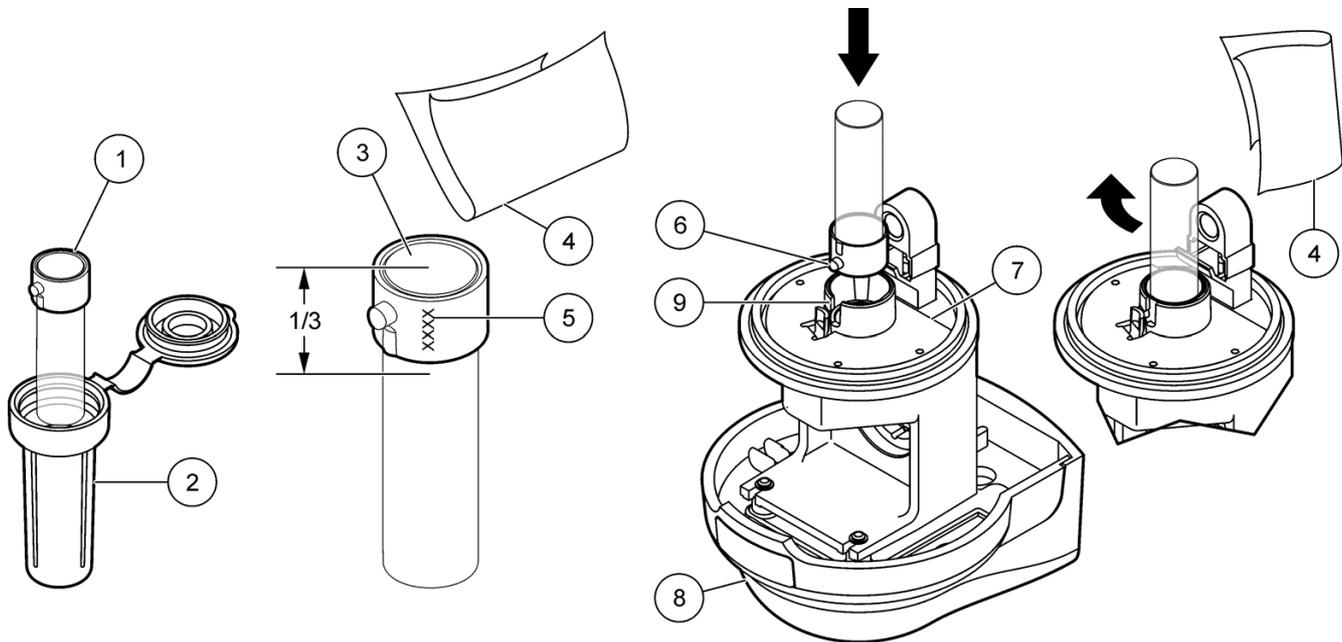


Figure 2 Dry standard installation

1	Dry standard	6	Dry standard locking pin
2	Dry standard protective case	7	Aperture plate
3	Dry standard top surface	8	Turbidimeter head assembly
4	Disposable wipe	9	Aperture plate notch
5	Dry standard serial number		

1.3 Perform a verification with the dry standard and the sc100 software

1. Choose **MAIN MENU**.
2. Choose **SENSOR SETUP**. Select the sensor for verification and press **ENTER**.
3. Choose **CALIBRATE, VERIFICATION, PERFORM VERIFICATION**.
4. Choose from **Active, Hold, or Transfer** outputs and press **ENTER**.
5. Select **DRY** for the verification type and press **ENTER**.
6. Verify that the serial number displayed matches the serial number etched on the dry standard collar. Press **ENTER**.
7. Attach the dry standard to the turbidimeter head. Put the head on the instrument body and push **ENTER**.
8. When the dry standard measurement is stable, push **ENTER** to accept the reading shown. A **GOOD VER** (Good Verification) or **BAD VER** (Bad Verification) will appear.

A bad verification indicates the instrument failed to meet the PFC, or that the instrument was unable to reach a stable reading.

[Table 1 on page 6](#) can be used to interpret verification values and determine what action should be taken. If the instrument consistently fails the verification process, contact the manufacturer.

9. When prompted, remove the dry standard and put the turbidimeter back on line. Push **ENTER**.
10. Select the **HOME** key to show on-line measurements.
11. Wipe off the dry standard after removal and put it in the protective case.

Section 2 General procedure for dry standard verification without software

This procedure includes the initial assignment of the baseline value to the dry standard on instruments without software. The procedure should be completed for each FT660 or FT660sc laser nephelometer immediately after the instrument has been successfully calibrated. The baseline value is used for instrument verifications performed between calibrations.

Once the baseline value of the dry standard has been determined, manually record the value. Also record the serial number of the dry standard and the serial number of the FT660 instrument. A baseline value is valid only for the combination of dry standard and instrument used to determine it.

Refer to [Figure 2 on page 4](#) as necessary when performing the procedures below.

Note: When not in use, keep the dry standard in the protective case.

2.1 Assign a baseline value to the dry standard

1. Remove the dry standard from the protective case. Examine the dry standard to make sure it is clean and free of chips or scratches.
2. Clean the dry standard with the disposable wipes provided.
3. Dry the top $\frac{1}{3}$ of the dry standard and the top surface.
4. Put the dry standard into the aperture plate. Make sure the alignment pin fits into the notch. Refer to [Figure 2 on page 4](#).
5. Turn the dry standard approximately $\frac{1}{8}$ of a turn to the right to lock the dry standard into position.
6. After the dry standard is attached to the turbidimeter head, clean the remainder of the glass to remove fingerprints and oils.
7. Attach the turbidimeter head on the instrument body.
8. After the reading becomes stable, record the value shown in the display. This is the first of 3 values which will be averaged to find a final baseline value.
9. Remove and clean the dry standard. Attach the dry standard to the aperture plate and put the turbidimeter head on the body. When the reading has stabilized, record the value shown.
10. Repeat step 9 and record the value shown a third time.
11. Find the average of the three recorded values. This is the final baseline value for the dry standard. This value will be compared to subsequent verification values for this specific combination of dry standard and instrument.

2.2 Verification procedure for the FT660 using the dry standard

1. Remove the dry standard from the protective case. Examine the glass and plastic to make sure it is clean and free of chips and scratches.
2. Clean the device using the disposable wipes provided.
3. Dry the top $\frac{1}{3}$ of the dry standard and the top surface.
4. Put the dry standard into the aperture plate. Make sure the alignment pin fits into the notch. Refer to [Figure 2 on page 4](#).
5. Turn the dry standard approximately $\frac{1}{8}$ turn to the right to lock the dry standard into position.
6. Dry off the remainder of the glass to remove fingerprints and oils.
7. Attach the turbidimeter head on the body.
8. When the reading becomes stable record the value shown.
9. Interpret the results. Refer to [Table 1](#) as a guide. The table assumes a PFC of ± 5 mNTU (the default value).

Table 1 Interpretation of values

Verification Value	Interpretation	Suggested Action
Within 5 mNTU of baseline	Successful verification	None
5 mNTU or greater below baseline	Instrument out of calibration	Clean instrument and repeat verification. Calibrate if necessary.
5 mNTU or greater above baseline	Possible contamination of turbidimeter body. Possible fluid on dry standard optical surface.	Clean body, bubble trap, detector and dry standard. Calibrate instrument and assign new baseline value.

Note: A significantly low value (25% or more below the expected value) can be an indication that the light source or detector is failing. If the operator repeatedly experiences verification failures with significantly low values, the instrument must be sent back to the manufacturer for repair.

Replacement parts and accessories

Description	Item no.
FT660 sc Verification Quick Check (CVM) Kit, includes:	6735500
• Dry standard	6735800
• Protective case for dry standard	6735400
• Disposable wipes	2097000
• Instruction sheet	DOC272.xx.90012
Aperture plate ¹ for dry standard, with replacement screws	6735600
• Aperture plate replacement instruction sheet	DOC273.xx.90049

¹ Included on FT660 sc instruments made after April 2008

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