Instruction Sheet

ICE-PIC™ Calibration/Verification Module

The ICE-PIC Calibration/Verification Module is designed to determine if an instrument calibration is valid. The device can be used on either the 1720C, 1720D, or 1720E series of turbidimeters. There is no need to stop or divert sample flow or to drain the turbidimeter. With the ICE-PIC module, performance verification can be completed in seconds.

The device can be used as a direct check or a secondary standard. To use the ICE-PIC as a direct check standard, compare the measurement of the instrument against the stated accuracy of the device (see Table 1). The direct check standard is only valid for the 1720D and 1720E series turbidimeters.

To use the device as a secondary standard, the turbidimeter must first be calibrated using a primary standard. Immediately following the calibration, a value can be assigned to the ICE-PIC device. Any deviation of the assigned value that exceeds some pre-set limits will indicate that the instrument is out of calibration.

Instrument Calibration Verification Using the Direct Check Method

To ensure instrument stability, the module is designed to be placed inside the 1720 turbidimeter body. The module may also be placed on a flat surface for use. Refer to Figure 1 and to the instructions below.

Note: *The ICE-PIC should measure within 25% of the stated value (1.0 or 2.0 NTU versions). If the measurement falls outside this range, the verification device should be returned to the factory for repair and recertification.*

1. Activate Hold Outputs.
2. Remove the head assembly from the turbidimeter.
3. Use a soft, lint-free cloth or tissue to remove ALL moisture from the photodetector and the turbidimeter head.

Important Note: *Do not allow any moisture to remain on the photodetector or turbidimeter head. Moisture introduced into the components of the ICE-PIC module will negatively affect performance. The module will not operate properly if the optical components have scratches, smudges, water drops, or other debris on them.*

4. Place the ICE-PIC module into the turbidimeter body with the alignment tabs of the ICE-PIC module resting on the alignment pins of the turbidimeter body. See Figure 1.

   Note: *Always make sure the turbidimeter head, including the photocell assembly, has been thoroughly dried before placing the head into the ICE-PIC module.*

5. Remove the protective cover from the ICE-PIC module.

   Note: *Replace the ICE-PIC cover after use.*

6. Place the turbidimeter head on the ICE-PIC module with the photodetector inserted into the hole in the top. Align the head assembly so the glass surface of the photodetector faces toward the center of the ICE-PIC module. See Figure 1.

Note: *Do not touch any of the optical components of the ICE-PIC module. Handle the device by the edges only.*

7. Observe the stable reading on the instrument display. Table 1 shows the expected NTU values for the available modules:

Table 1 Expected NTU Values for Available Modules

Module Stated NTU Value	Catalog Number	Precision*	Accuracy*
20 NTU ICE-PIC module	52250-00	2%	20 NTU ±10%
1 NTU ICE-PIC module	52215-00	2%	1.0 NTU ±10%
0.5 NTU ICE-PIC module	52225-00	2%	0.5 NTU ±10%

* Applies to the 1720D or 1720E series only.

8. If the reading is within the specified range, the calibration verification is complete. If the reading is not within specifications, recalibrate the turbidimeter with StablCal® Stabilized Formazin or user-prepared formazin and repeat this procedure.

   After calibration, if the reading is still not within specifications, the optical components inside the module may be damaged or dirty. If you are calling from inside the United States, contact the Hach Service Department at 1-800-227-4224. Outside the United States, contact the dealer or distributor in your area.

Note: *This device contains no user-serviceable components. All cleaning and repair must be performed by trained Hach Service personnel.*

Note: *The 1720E series of turbidimeters will automatically determine if the ICE-PIC is within the 25% requirements for operation. If the measured value falls outside this 25% boundary, the 1720E will reject its use as a verification device.*

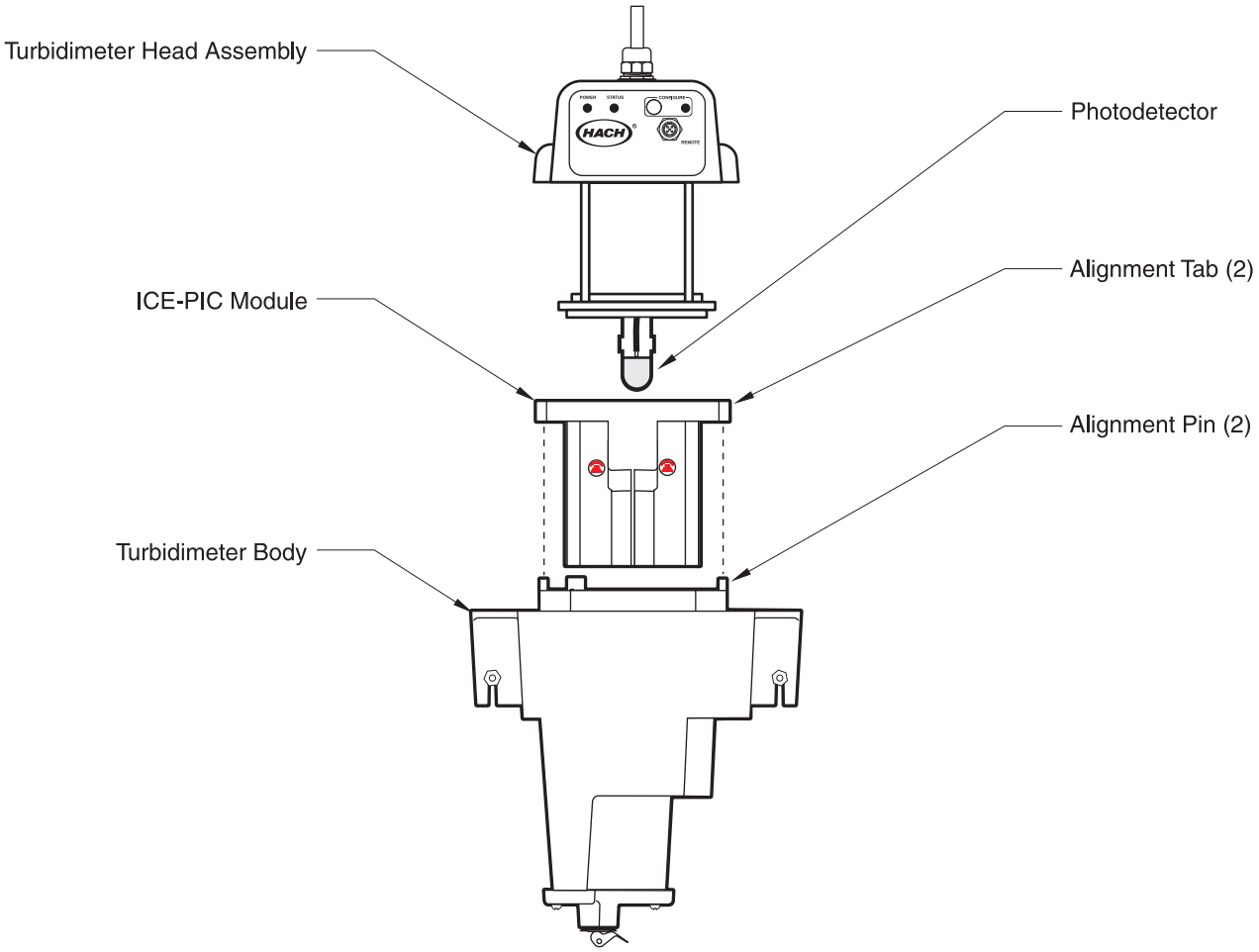
Note: *Always make sure the turbidimeter head, including the photocell assembly, has been thoroughly dried before placing the head into the ICE-PIC module.*

9. Remove the turbidimeter head from the ICE-PIC module and immediately replace the protective cover on the ICE-PIC module.
10. Remove the ICE-PIC module from the turbidimeter body.
11. Reinstall the turbidimeter head on the turbidimeter body.

Note: *Replace the ICE-PIC cover after use.*

12. Deactivate Hold Outputs (1720D or 1720E Series only).

Figure 1 Using the ICE-PIC Module



Instrument Calibration for Non-regulatory Reporting

The ICE-PIC module may be used to calibrate non-regulatory reporting turbidimeters. Refer to the *Comparative* or *One-point Calibration* procedure in the instruction manual supplied with your turbidimeter and use the ICE-PIC module in place of StablCal Stabilized Formazin or user-prepared formazin.

Note: *Confirm that the ICE-PIC is within 10% of the primary calibration before using if for future calibrations.*

Calibration Verification Using the ICE-PIC as a Secondary Standard

Note: *1720C Turbidimeters manufactured before August 6, 1990 require an aperture kit to allow the ICE-PIC module to function properly. Please refer to the instruction sheet (Cat. No. 52002-89) to determine if your turbidimeter is affected.*

The procedures that follow have two different purposes. The first procedure contains instructions for assigning initial values to the ICE-PIC for each turbidimeter that the module is used with. The second procedure is used to verify the calibration of the 1720 series turbidimeters.

Assigning Initial Values to the ICE-PIC

Note: *The 1720E Series Turbidimeter provides an electronic verification for measurement and storage of the results. Refer to the 1720E manual for more information on performing an electronic verification using the ICE-PIC.*

1. Clean the turbidimeters according to the instructions in the appropriate 1720 series manual.
2. Calibrate the instrument(s) according to the instructions in the appropriate 1720 Series manual.
3. After calibration(s) are complete, remove the turbidimeter head from the instrument body. Use a soft, lint-free tissue and dry the entire detector. Inspect the detector window to ensure it is free of dust, moisture, or other contaminants.
4. Place the turbidimeter head assembly onto the ICE-PIC module.
5. Allow the displayed value to become stable. Depending on the signal averaging setting selected, this may take between 15 and 90 seconds.
6. Record the value obtained and the date into the Reference Value/Date column in the verification log for each of the turbidimeters that will be verified with this ICE-PIC module.
7. After the verification reference values have been entered into the log for all turbidimeters to be used with this ICE-PIC module, proceed with the next procedure.

   Note: *The values for different 1720 turbidimeters measured on a single ICE-PIC may vary slightly. It is important to follow the procedure above for each 1720 turbidimeter that will be verified with a single ICE-PIC, and to obtain a unique value for each.*

Performing Verification to Confirm Instrument Calibration Stability for the 1720C

1. Remove the 1720 Turbidimeter head from the turbidimeter body.
2. Use a soft, lint-free tissue and dry the entire detector. Inspect the detector window to ensure it is free of dust, moisture, or other contaminants.
3. Place the turbidimeter head assembly onto the ICE-PIC module.
4. Allow the displayed value to become stable. Depending on the signal averaging setting selected, this may take between 15 and 90 seconds.
5. Compare this value with the value that was initially assigned after calibration (from the procedure above). If the value has changed more than 10% relative to the initial value, recalibrate the instrument.

Factory Re-certification

Factory re-certification of the ICE-PIC is recommended if the IE-PIC value falls outside ± 25% of its stated range, or if the device is damaged.

1720C Calibration Verification Log

For a working electronic version of this table visit the Hach web site at http://www.hach.com/time/1720CCalVer.xls

***If the verification value has changed by more that 10% to the reference value, recalibrate the instrument.**

Assigned Value	Sensor Location	Reference Value/Date Initials	Verification Value/Date Initials	Verification Value/Date Initials	Verification Value/Date Initials	Verification Value/Date Initials	Verification Value/Date Initials	Verification Value/Date Initials	Verification Value/Date Initials	Verification Value/Date Initials	Verification Value/Date Initials	Verification Value/Date Initials
Example (20 NTU)	Filter 1	19.9 NTU 2/12/01 JH	19.5 NTU 2/26/01 DS	19.8 NTU 3/12/01 EA	20.1 NTU 3/26/01 JH	19.8 NTU 4/9/01 DS	20.3 NTU 4/23/01 JH	20.6 NTU 5/7/01 JH	20.4 NTU 5/21/01 EA	20.0 NTU 6/4/01 EA		

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HACH COMPANY
WORLD HEADQUARTERS
Telephone: (970) 669-3050
FAX: (970) 669-2932

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