

Package Insert

ViewRNA® Temperature Validation Kit

Cat. No. QV0523

Product Overview

The ViewRNA Temperature Validation Kit uses a National Institute of Standards and Technology (NIST) calibrated digital thermometer with Type-K beaded probe to assess temperature accuracy. This kit may be used for any ViewRNA Assays to evaluate the temperature of incubators or ThermoBrite systems. For best assay results, we recommend calibrating all incubators including the ThermoBrite with the ViewRNA Temperature Validation Kit before running the assay. It is crucial that all incubators are validated at the assay-specified hybridization temperature.

Intended Use

The ViewRNA Temperature Validation Kit is designed to precisely measure the temperature in any incubator used in the ViewRNA Assays. Refer to appropriate ViewRNA Assays user manual for recommended incubators.

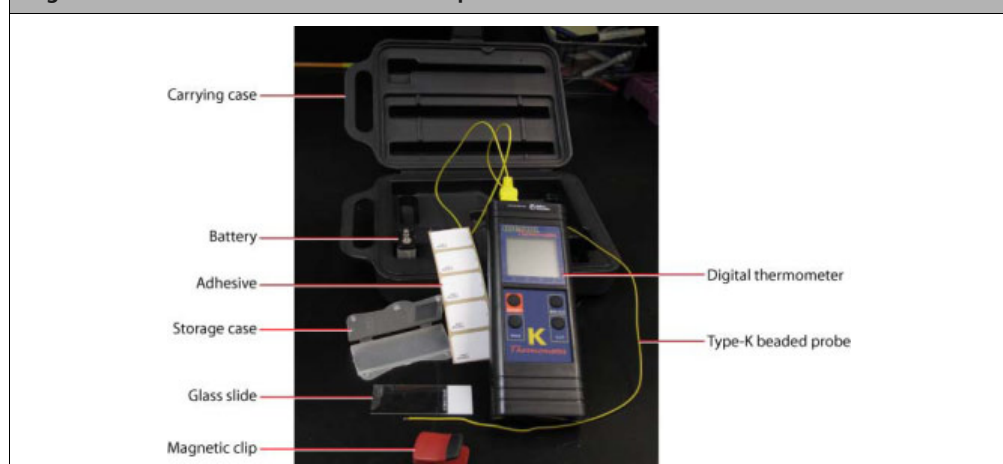
Contents and Storage

The ViewRNA Temperature Validation Kit contains the following components. The kit has a shelf life of 1 year from date of receipt when stored as recommended.

Table 1. ViewRNA Temperature Validation Kit Contents and Storage

Component	Description	Quantity	Storage
Digital Thermometer	NIST calibrated digital thermometer with Type-K beaded probe	1	15-30 °C
Glass Slide	75 mm x 25 mm glass slide	1	15-30 °C
Storage Case	Storage case for the glass slide	1	15-30 °C
Adhesive	Secures Type-K beaded probe to the glass slide	5	15-30 °C
Magnetic Clip	Secures Type-K beaded probe while measuring the air temperature (dry incubator)	1	15-30 °C
Carrying Case	Carrying case for the ViewRNA Temperature Validation Kit	1	15-30 °C
Battery	9V battery for the digital thermometer	1	15-30 °C

Figure 1. Contents of the ViewRNA Temperature Validation Kit



Required Materials Not Provided

The following materials are required if you are validating the temperature of a ThermoBrite incubator system or humidifying incubator.

Table 2. Required Material Not Provided

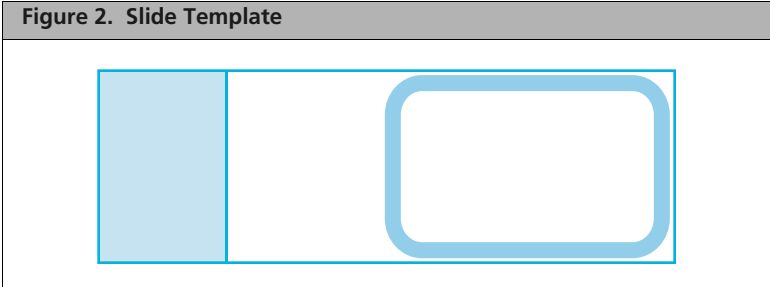

Item	Supplier	Required for validating a...
Double-distilled water (ddH ₂ O)	Major Laboratory Supplier	ThermoBrite Incubator Humidifying Incubator
Hydrophobic Barrier Pen	Vector Laboratories P/M H4000 or, Affymetrix QVC0500	ThermoBrite Incubator Humidifying Incubator
Aluminum Slide Rack	VWR P/N 100493380	Humidifying Incubator

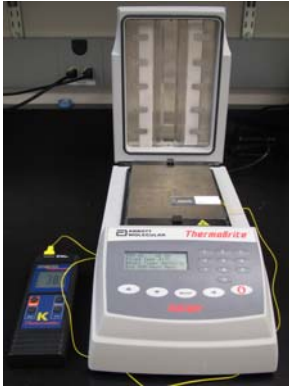

Overview

Here procedures are provided for the temperature validation of the following incubators:

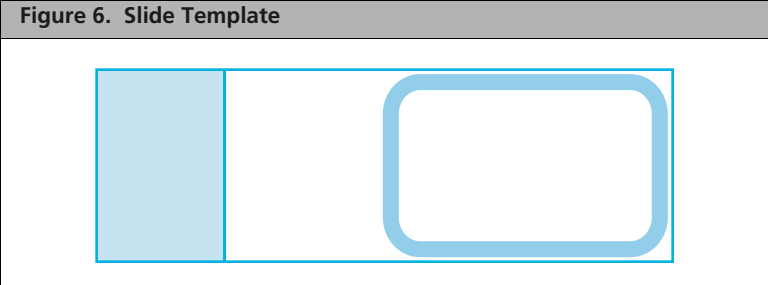

- ThermoBrite incubator
- Humidifying incubator (tissue culture incubator without CO₂)
- Dry incubator

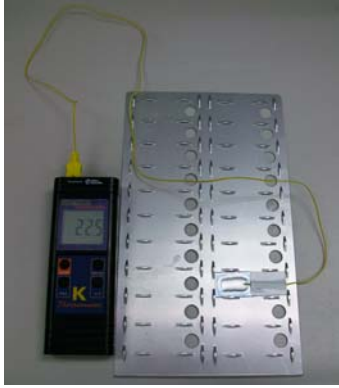

Validating the Temperature of a ThermoBrite Incubator

Step	Action
<p>Step 1 Assemble Kit</p>	<p>A. Insert the battery to activate the digital thermometer.</p> <p>B. Remove the glass slide from the carrying case.</p> <p>C. Create a hydrophobic barrier by placing the slide over the template image below (Figure 2), and lightly trace the blue rectangle 2-4 times with a hydrophobic barrier pen.</p> <hr/> <p>IMPORTANT: Dab the hydrophobic pen on a paper towel several times before use to ensure proper flow of the hydrophobic solution.</p> <hr/> <p>Figure 2. Slide Template</p>  <p>D. Allow hydrophobic barrier to air dry for 20-30 minutes at RT before proceeding to the next step.</p> <p>E. Place the Type-K beaded probe over the hydrophobic barrier. Using the supplied adhesive, secure it in place.</p> <p>F. Insert the Type-K beaded probe plug into the digital thermometer. Refer to the manufacturer's instruction manual for thermometer specifications.</p> <p>G. Turn on the digital thermometer device.</p> <p>Figure 3. Assembled Kit</p> 
<p>Step 2 Prepare ThermoBrite</p>	<p>A. Turn on the ThermoBrite incubator.</p> <p>B. Set the temperature to a fixed 40°C.</p> <p>C. Insert two wet humidifying strips into the ThermoBrite.</p>


Step	Action
<p>Step 3 Set Up Glass Slide</p>	<p>A. Place the assembled glass slide onto the ThermoBrite with the hydrophobic barrier facing up. Make sure the Type-K beaded probe is securely attached to the slide.</p> <hr/> <p>IMPORTANT: The glass slide must remain in contact with the hot plate at all times to ensure an accurate reading (see Figure 4).</p> <hr/> <p>Figure 4. Complete Setup</p>  <p>B. Add 400 μL of ddH₂O onto the slide. Make sure the ddH₂O stays within the hydrophobic barrier and is in contact with the Type-K beaded probe (see Figure 5).</p> <hr/> <p>Figure 5. Glass Slide on the Hot Plate with ddH₂O Added</p> 
<p>Step 4 Equilibrate the ThermoBrite</p>	<p>A. Close the lid making sure there is sufficient slack in the wiring to prevent the slide from lifting off the hot plate surface.</p> <p>B. Wait 10 minutes for the temperature to equilibrate.</p> <p>C. Allow an additional 20 minutes equilibration time before recording the temperature.</p>
<p>Step 5 Measure and Adjust Temperatures</p>	<p>A. Repeat Step 3 -Step 4 to measure the temperature at four different regions of the hot plate.</p> <p>B. If necessary, adjust the temperature setting so that the thermometer displays the assay-specified temperature. For example, if the digital thermometer indicates the temperature is 39°C when the ThermoBrite is set at 40°C, change the setting temperature of the ThermoBrite to 41°C to accurately reflect the +1°C deviation.</p> <hr/> <p>IMPORTANT: The fixed temperature of the ThermoBrite and the actual temperature measured by the digital thermometer may differ by $\pm 2^\circ\text{C}$. We recommend calibrating the ThermoBrite at least once a month to ensure accuracy.</p> <hr/>


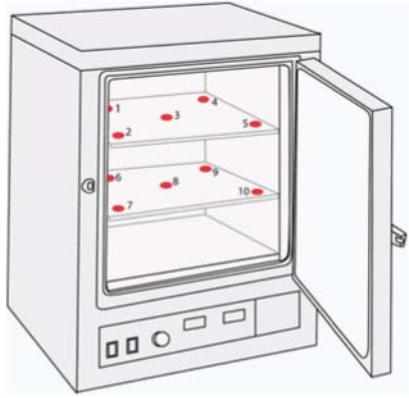
Validating the Temperature of a Humidifying Incubator

Step	Action
<p>Step 1 Assemble Kit</p>	<p>A. Insert the battery to activate the digital thermometer.</p> <p>B. Remove the glass slide from the carrying case.</p> <p>C. Create a hydrophobic barrier by placing the slide over the template image below (Figure 6), and lightly trace the blue rectangle 2-4 times with a hydrophobic barrier pen.</p> <hr/> <p>IMPORTANT: Dab the hydrophobic pen on a paper towel several times before use to ensure proper flow of the hydrophobic solution.</p> <hr/> <p>Figure 6. Slide Template</p>  <p>D. Allow hydrophobic barrier to air dry for 20-30 minutes at RT before proceeding to the next step.</p> <p>E. Place the Type-K beaded probe over the hydrophobic barrier. Using the supplied adhesive, secure it in place.</p> <p>F. Insert the Type-K beaded probe plug into the digital thermometer. Refer to the manufacturer's instruction manual for thermometer specifications.</p> <p>G. Turn on the digital thermometer device.</p> <p>Figure 7. Assembled Kit</p> 
<p>Step 2 Prepare Humidifying Incubator</p>	<p>A. Turn on the humidifying incubator.</p> <p>B. To maintain the humidity level at more than 65% (without CO₂) for the hybridization condition, fill bottom tray nearly full with ddH₂O.</p> <p>C. Set the temperature to 40°C.</p> <p>D. Allow the incubator to equilibrate for 30 minutes before starting the calibration.</p>

Step	Action
Step 3 Set Up Glass Slide	<p>A. Place the assembled glass slide onto an aluminum rack with the hydrophobic barrier facing up. Make sure the Type-K beaded probe is securely attached to the slide.</p> <hr/> <p>IMPORTANT: The glass slide must remain flat on the aluminum rack at all times to ensure an accurate reading.</p> <hr/> <p>B. Add 400 μL of ddH₂O onto the slide. Make sure the ddH₂O stays within the hydrophobic barrier and is in contact with the Type-K beaded probe (see Figure 8).</p> <div data-bbox="293 499 1058 961" style="border: 1px solid black; padding: 5px;"> <p>Figure 8. Glass Slide on the Aluminum Rack with ddH₂O Added</p>  </div>
Step 4 Equilibrate Humidifying Incubator	<p>A. Place the assembled glass slide, on the aluminum rack, into the humidifying incubator.</p> <p>B. Close the door making sure there is sufficient slack in the wiring to prevent the slide from lifting off the aluminum rack.</p> <p>C. Wait 10 minutes for the temperature to equilibrate.</p> <p>D. Allow an additional 20 minutes equilibration time before recording the temperature (see Figure 9).</p> <div data-bbox="293 1192 1058 1667" style="border: 1px solid black; padding: 5px;"> <p>Figure 9. Complete Setup</p>  </div>
Step 5 Measure and Adjust Temperatures	<p>A. Repeat Step 3 - Step 4 to measure the temperature at four different regions of the humidifying incubator.</p> <p>B. If necessary, adjust the temperature setting so that the thermometer displays the assay-specified temperature. For example, if the digital thermometer indicates the temperature is 39°C when the humidifying incubator is set at 40°C, change the setting temperature of the incubator to 41°C to accurately reflect the +1°C deviation.</p> <hr/> <p>IMPORTANT: The fixed temperature of the humidifying incubator and the actual temperature measured by the digital thermometer may differ by $\pm 2^\circ\text{C}$. We recommend calibrating the humidifying incubator at least once a month to ensure accuracy.</p>

Validating the Temperature of a Dry Incubator

Step	Action
Step 1 Assemble Kit	<p>A. Insert the battery to activate the digital thermometer.</p> <p>B. Slide the Type-K beaded probe through the magnetic clip as shown in Figure 10. Make sure the Type-K beaded probe is pointing upward so that it is not in contact with any metal surface when put inside the incubator.</p> <p>C. Insert the Type-K beaded probe into the digital thermometer. Please refer to the manufacturer's instruction manual for thermometer specifications.</p> <p>D. Turn on the digital thermometer device.</p> <div data-bbox="293 600 967 1062" style="border: 1px solid black; padding: 5px;"> <p>Figure 10. Assembled Kit</p>  </div>
Step 2 Prepare Dry Incubator	<p>A. Turn on the dry incubator.</p> <p>B. Set the temperature to 40°C.</p> <p>C. Allow the dry incubator to equilibrate.</p>

Step	Action
<p>Step 3 Measure and Adjust Dry Incubator Temperature</p>	<p>A. Place the assembled Type K beaded probe inside the incubator (see Figure 11).</p> <p>B. Close the door making sure there is sufficient slack in the wiring.</p> <div data-bbox="293 327 889 369" style="border: 1px solid black; padding: 2px;"> <p>Figure 11 Complete Setup for Dry Incubator</p> </div> <div data-bbox="418 394 748 831" style="border: 1px solid black; text-align: center;">  </div> <p>C. Wait 10 minutes for temperature to equilibrate.</p> <p>D. Record the temperature.</p> <p>E. If necessary, adjust the dry incubator temperature settings so that the digital thermometer reads 40°C.</p> <p>IMPORTANT: The fixed temperature of the dry incubator and the actual temperature measured by the digital thermometer might differ by $\pm 2^\circ\text{C}$. We recommend calibrating the dry incubator at least once every 6 months to ensure accuracy.</p>
<p>Step 4 Assess Dry Incubator Temperature Uniformity</p>	<p>A. Repeat Step 2 -Step 3 to measure the temperature at multiple regions in the incubator to determine temperature uniformity (see Figure 12 for an example).</p> <p>IMPORTANT: Make sure the temperature equilibrates before recording the measurements.</p> <div data-bbox="293 1230 889 1272" style="border: 1px solid black; padding: 2px;"> <p>Figure 12. Dry Incubator Uniformity Test Positions</p> </div> <div data-bbox="386 1297 792 1692" style="border: 1px solid black; text-align: center;">  </div> <p>IMPORTANT: The temperature for all positions should be $40 \pm 1^\circ\text{C}$.</p>
<p>Step 5 Assess Ramp-Up Time</p>	<p>A. Open the incubator door for 1 minute then close the door and measure the time needed for the temperature to return to 40°C.</p> <p>B. Repeat the previous step two more times.</p> <p>IMPORTANT: Do not use the incubator for the assay if it takes more than 5 minutes to return to 40°C or if it overshoots by more than 2°C during recovery.</p>

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For Research Use Only: Not for use in diagnostic procedures.

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