



Type K Temperature Sensor

PS-2134

Type K sensor box

Type K probe



Sensor Specifications	
Sensor/Probe tip range:	-200°C to +1000°C
Probe insulation range:	-73°C to +482°C
Accuracy:	±3°C or 3% of reading, whichever is greater
Resolution:	0.1°C
Default sample rate:	2 samples per second
Maximum sample rate:	10 samples per second
Sensing element:	chromel and alumel thermocouple

Type K Sensor Quick Start

The PS-2134 Type K Temperature Sensor measures high temperatures of gases, open flames, or objects ranging from -200 to +1000 degrees Celsius.

Additional Equipment Needed

- PASPORT™ interface (USB Link, PowerLink, Xplorer, etc.)
- EZscreen or DataStudio® software (version 1.8.5 or later)

Equipment Setup

1. Connect the PASPORT interface to a USB port on your computer or to a USB hub.
2. Plug the cable of the Type K probe into the Type K sensor box.
3. Connect the Type K Sensor to the PASPORT interface.
4. The software launches when it detects a PASPORT sensor. From the PASPORTAL window, select a point of entry.



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012-08453B



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Calibrating the Type K Temp. Sensor

Note: Calibration of the Type K Temp. Sensor is not required. However, if you wish to calibrate for better accuracy, follow the instructions below.

CAUTION: The probe of the PS-2134 Type K Temperature Sensor was not designed for use in chemical solutions, other than water. (However, if you cover the probe with an optional Teflon[®] sleeve*, you can use the probe in chemicals.*) Also, never place the Type K sensor box in liquids, a heating element, or fire. Placing the sensor box in liquids or an open flame will permanently damage the sensor. PASCO will not replace or cover the costs of a damaged sensor due to negligent or improper use.

DataStudio Calibration

Equipment required: Type K Temperature Sensor, boiling water, cold water, thermometer, two beakers or plastic containers

Procedure (two-point calibration)

1. Plug the Type K sensor box into a PASPORT USB interface connected to your computer. Plug the Type K probe into the sensor box.
2. In DataStudio, click on the **Setup** button to open the PASPORT Setup window.
3. In the PASPORT™ Setup window, scroll to the Type K Temperature Sensor box and click the **Calibrate** button. (Note: The software is set to use 0°C and 100°C as the two points for calibration. You may choose to enter different values and use a thermometer as a reference.)
4. Place the Type K probe in the beaker filled with 0°C water (or water at your first temperature point).
5. In the Calibration window, click the **Set** button.
6. Repeat steps 4-5 for a beaker filled with 100°C water (or water at your second temperature point).
7. Click the **OK** button to save the calibration values.

PASPORT Xplorer Calibration

Equipment required: Type K Temperature Sensor, boiling water, cold water, thermometer, two beakers or plastic containers

Procedure:

1. Plug in the Type K Sensor (with probe attached) into an Xplorer.
2. Turn on the Xplorer.
3. Press **Display** (⊞) until the calibrate screen appears.
4. Press the **Check** (✓) button.
5. Press the **Tab** (⇄) button to move through the digits.
6. Use the **Plus (+)** or **Minus (-)** buttons to increase or decrease each digit until the display matches the value of the selected standard sample.
7. Place the Type K probe in the beaker filled with 0°C water (or water at your first temperature point). (Note: The software is set to use 0°C and 100°C as the two points for calibration. You may choose to enter different values and use a thermometer as a reference.)
8. Press the **Check** (✓) button.
9. Repeat steps 7-8 for the beaker filled with 100°C water (or other water temperature for your second point).

*Teflon sensor covers are available from PASCO. If you plan to frequently use the Type K Temperature Sensor with chemicals, you can order a package of 10 Teflon covers using part no. CI-6549.

Teflon[®] is a registered trademark of DuPont.

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Calibrating the Type K Temp. Sensor

Note: Calibration of the Type K Temp. Sensor is not required. However, if you wish to calibrate for better accuracy, follow the instructions below.

CAUTION: The probe of the PS-2134 Type K Temperature Sensor was not designed for use in chemical solutions, other than water. (However, if you cover the probe with an optional Teflon[®] sleeve*, you can use the probe in chemicals.*) Also, never place the Type K sensor box in liquids, a heating element, or fire. Placing the sensor box in liquids or an open flame will permanently damage the sensor. PASCO will not replace or cover the costs of a damaged sensor due to negligent or improper use.

DataStudio Calibration

Equipment required: Type K Temperature Sensor, boiling water, cold water, thermometer, two beakers or plastic containers

Procedure (two-point calibration)

1. Plug the Type K sensor box into a PASPORT USB interface connected to your computer. Plug the Type K probe into the sensor box.
2. In DataStudio, click on the **Setup** button to open the PASPORT Setup window.
3. In the PASPORT™ Setup window, scroll to the Type K Temperature Sensor box and click the **Calibrate** button. (Note: The software is set to use 0°C and 100°C as the two points for calibration. You may choose to enter different values and use a thermometer as a reference.)
4. Place the Type K probe in the beaker filled with 0°C water (or water at your first temperature point).
5. In the Calibration window, click the **Set** button.
6. Repeat steps 4-5 for a beaker filled with 100°C water (or water at your second temperature point).
7. Click the **OK** button to save the calibration values.

PASPORT Xplorer Calibration

Equipment required: Type K Temperature Sensor, boiling water, cold water, thermometer, two beakers or plastic containers

Procedure:

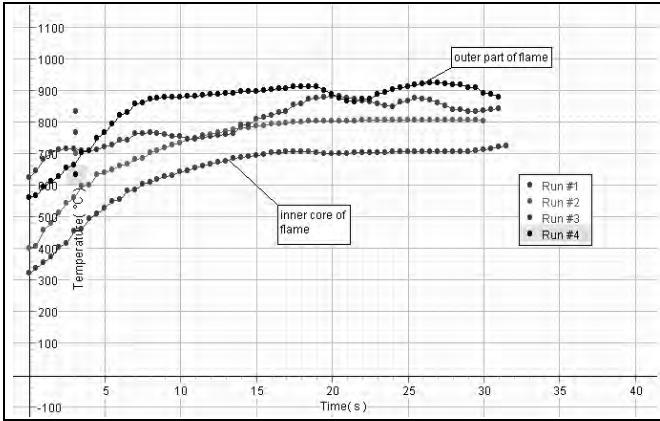
1. Plug in the Type K Sensor (with probe attached) into an Xplorer.
2. Turn on the Xplorer.
3. Press **Display** (⊞) until the calibrate screen appears.
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
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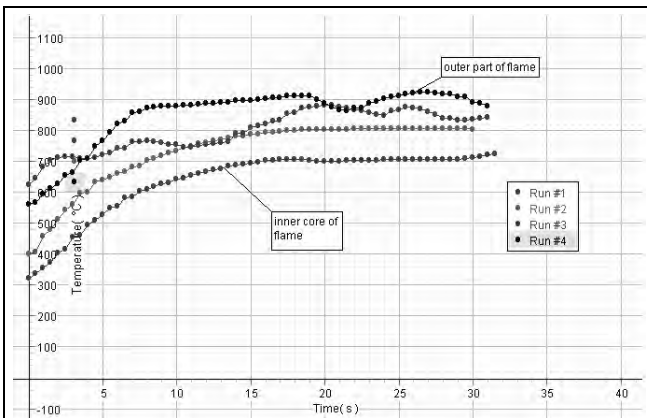
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Comparing Temperatures in Different Parts of a Candle Flame



DataStudio/DataStudio Lite Task:	Procedure:
Change units of measurement:	In the PASPORT Sensor window, scroll to the Type K sensor. Use the down arrow to select degrees C, F, or K.
Scale to fit the data:	Click the Scale-to-Fit () button.
Scale the axes:	With your mouse, click on the x-axis and drag left or right; click on the y-axis and drag up and down.
View data statistics:	Click the Statistics () button and select Minimum, Maximum, or Mean.

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Type K Activity - Mapping the Temperature of a Candle Flame

Equipment required: PS-2134 Type K Sensor, PASPORT interface, USB-compatible computer, DataStudio software (version 1.8.5 or later), candle with glass holder, matches.

SAFETY WARNING: When working with candles or other hot objects, always follow standard fire and health safety precautions in your classroom. Do not touch the Type K probe with your hands, fingers, or any other body part. When the probe is put in a hot flame and removed, the probe will be hot (between 400 to 1400 degrees Celsius). Touching or mishandling the probe could cause severe burns or permanent bodily injury.

Procedure:

1. Connect the Type K Temperature Sensor to a PASPORT interface connected to your computer (See CARD 1A for instructions).
2. Light a candle and place it in a glass holder.
3. Open a Graph display in DataStudio and click the **Start** button.
4. (Before performing the next few steps, please read the safety warning above.) Slowly insert just the tip of the Type K probe into the red, inner core of the candle flame to take a reading.
5. After about 30 seconds, click the **Stop** button. Slowly remove the probe, being careful not to touch the probe with your hand or to any other body parts.
6. Allow the probe to cool to room temperature on a metal surface.
7. Repeat steps 5 and 6 for the orange, yellow, and blue colors in the flame. (*Note: Move the probe directly across, not up and down the flame.*) Compare your results. Explain why different colors of the flame have different temperatures. Is the temperature higher in the inner core or the outer part of the flame? Why?

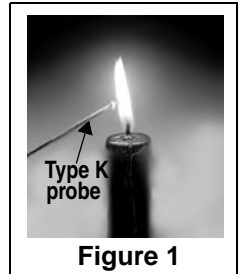


Figure 1

Type K Activity - Mapping the Temperature of a Candle Flame

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Procedure:

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2. Light a candle and place it in a glass holder.
3. Open a Graph display in DataStudio and click the **Start** button.
4. (Before performing the next few steps, please read the safety warning above.) Slowly insert just the tip of the Type K probe into the red, inner core of the candle flame to take a reading.
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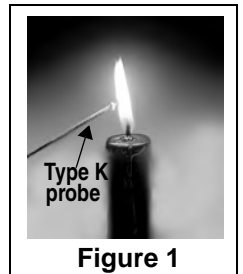


Figure 1