

# Kestrel<sup>®</sup> 3000 Pocket Weather<sup>™</sup> Meter with Backlight

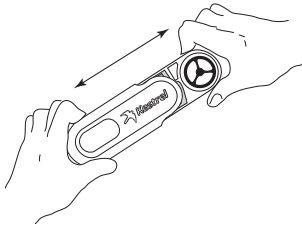
Thank you for purchasing the Kestrel 3000 Pocket Weather Meter. This instrument will measure the following environmental conditions:

- wind speed
- maximum wind gust
- average wind speed
- temperature
- wind chill
- relative humidity
- heat stress
- dewpoint

This instrument also features a data hold function, a backlight, and an automatic power-down function. Every unit is fully tested at our factory for measurement accuracy and waterproof integrity. The one-year warranty can be extended to two years by simply filling out the attached registration card.

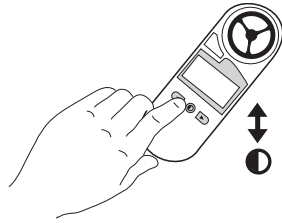
## OPERATION

### 1) Slide off cover.



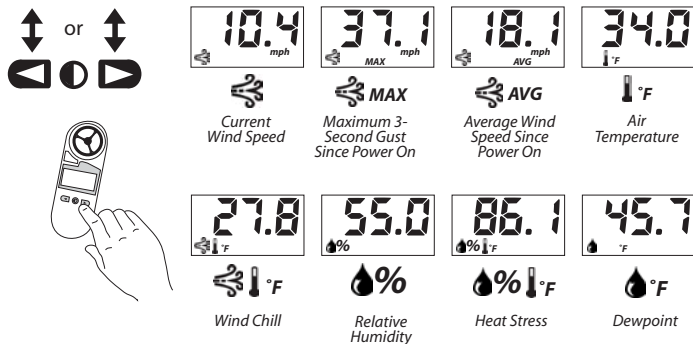
### 2) Turn on:

Press the center button (●) to turn on the unit.



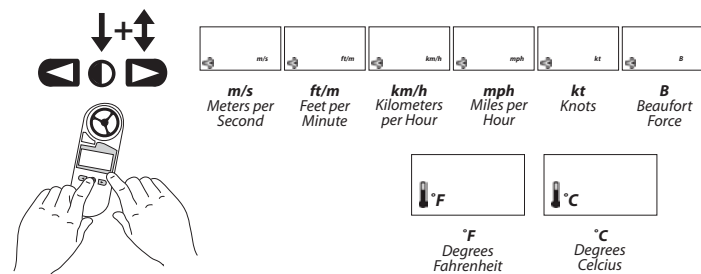
### 3) Select operating mode.

Press the right arrow (▶) to scroll through the measurements listed below. Press the left arrow (◀) to scroll through the measurements in reverse order. The instantaneous measurements will be displayed. (See *Understanding the Measurements* section for more information.)



### 4) Select the units of measure.

Press ▶ while holding ● to scroll through the units of measure.



- 5) Hold mode.** Press ◀ while holding ● to hold the measured value on the display. The word "HOLD" will blink to indicate the Hold Mode. Press ◀ or ▶ to view the other measurements in Hold Mode. Press ◀ while holding ● to exit the Hold Mode. This mode can be useful for taking measurements when unable to view the display, as within a duct. The Max and Avg Wind Speed Modes will continue to work as usual.
- 6) Turn on the backlight.** Press ● to activate the backlight for 10 seconds. If ◀ or ▶ are pressed while the backlight is illuminated, the backlight will remain illuminated for another 10 seconds. Press ● while the backlight is illuminated to manually turn off the backlight.
- 7) Turn off.** Hold ● for 2 seconds to manually turn off the unit. The unit will automatically turn off if no buttons have been pressed for 45 minutes.

## UNDERSTANDING THE MEASUREMENTS

**Wind Speed** - average over the previous three seconds. The measurement will be accurate for air flow through the front or rear of the unit.

**Maximum Wind Gust** - maximum 3 - second wind speed since the unit was turned on.

**Average Wind Speed** - average wind speed since the unit was turned on.

**Temperature** - instantaneous temperature of the thermistor, which is located at the end of the long coiled leads in the open cavity below the impeller. The exposed thermistor will respond quickly to changes in temperature when air flows past it. For fastest response, either hold the unit into the wind or wave the unit side to side for 15 seconds. Readings should be taken in the shade.

**Wind Chill** - combination of wind speed and temperature, as defined by the US National Weather Service. Wind chill is the effective temperature on a human or animal at low temperatures due to wind speed. Wind chill readings will be the same as the temperature readings above 45°F or below 3 mph.

**Relative Humidity** - amount of moisture in the air compared to the amount of moisture the air can hold for the given temperature, represented as a percent. Because relative humidity is also a function of the temperature, the response time will be dependent on the temperature response time (see temperature section above). Readings should be taken in the shade.

**Heat Stress** - combination of temperature and humidity, as defined by the US National Weather Service. Heat stress is the effective temperature on a human or animal at high temperatures due to humidity. Heat stress readings will be the same as the temperature readings below 70°F.

**Dewpoint** - calculated based on temperature and humidity measurements, as a measure of moisture content in the air. If the dewpoint is very close to the temperature, the air is humid. If the temperature and dewpoint are the same, dew will form. If this happens below freezing, frost will form.

## MAINTENANCE & TROUBLESHOOTING

### Storing Your Kestrel

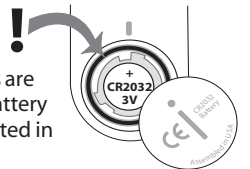
Avoid storing your Kestrel where it will be exposed to temperatures below -30°C [-22°F] or above 80°C [176°F] for extended periods of time. Doing so may cause permanent damage. (Note that the inside of a car parked in the hot sun can reach very high temperatures.)

### Use of the Lanyard and Cover

The cover can be captured on the lanyard to avoid loss. First, remove the cord poplock. Then feed the lanyard end through the large opening in the over and out the slot. Replace the poplock on the lanyard.

### Replacing the Battery

When your display flashes the low battery indicator (⚡), replace the battery. Use a large coin to open the battery compartment. Insert a new CR2032 coin cell (available where watch batteries are sold), positive (+) pole up. When replacing the battery door, be sure to keep the black rubber o-ring seated in the groove on the case back.



Thank you for purchasing a Kestrel Pocket Weather Meter! **Please register your Kestrel within 30 days of receipt and receive an additional year of warranty coverage.** This information will be kept confidential. Any information collected about our customers will not be sold or distributed, and will be used for the business of Nielsen-Kellerman only. We are conducting this survey in order to improve the quality of our product. Thank you for your cooperation and we appreciate your time.

The team at Nielsen-Kellerman stands proudly behind our products. If you have any questions or comments please feel free to call us at 1.800.784.4221 or visit our website at [www.nkhome.com](http://www.nkhome.com).

Sincerely,

*Katu*

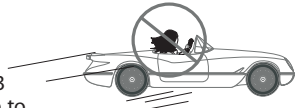
Nielsen-Kellerman  
Sales Department

**Why does the Impeller Appear Imbalanced?**

It is NORMAL for the impeller to oscillate as it comes to a stop. It is NOT imbalanced. Rather, it contains a very small magnet which responds to the earth's magnetic fields. This does not affect the accuracy of the wind speed readings because the magnetic field applies both a braking and an accelerating force which cancel each other. The impeller has been calibrated to provide wind speed readings accurate to within at least ± 3%.

**High Speed Use**

After several hours of sustained operation over 25 M/S (~49 KT, 90 KM/H, 56 MPH or 4,923 FPM), the Kestrel will lose some accuracy due to wear of the sapphire bearings in the impeller.



**Replacing the Impeller**

Press FIRMLY on the sides of the black impeller housing with your thumbs to remove the entire assembly. When inserting the new impeller, be sure the arrow is facing the display side of the unit, and is aligned with the top of the meter. Press on the sides of the housing rather than the center.



**Taking Accurate Humidity, Heat Stress and Dewpoint Measurements**

The patented system for measuring relative humidity allows for extremely fast and accurate readings. The sensor is located in the large hole on the rear of the unit. Even extreme and abrupt changes in the surrounding humidity will be measured within several minutes. To test this, place your hand around the rear of the unit. Within several seconds, the humidity will increase dramatically. After removing your hand, the humidity will quickly begin to decrease. Next, place your hand near the rear of the unit and wave the unit back and forth. The humidity will not change because the air flow is diluting the humidity from your hand.

This example shows the importance of keeping air flow past the sensor while taking a measurement. If there is no natural air flow past the sensor, wave the unit back and forth. It is also reasonable to lay the unit down on a solid surface for several minutes to allow the sensor to adjust.

**Humidity Sensor Calibration**

The humidity sensor has been factory calibrated to be accurate to within ± 3%. For recalibration, you may either return it to Nielsen-Kellerman for factory calibration, or visit [www.nkhome.com/www/3000/fieldcalibration.html](http://www.nkhome.com/www/3000/fieldcalibration.html) for field calibration instructions. Field Calibration Kits are also available for sale online.

**BEAUFORT SCALE**

The Beaufort Scale is a system for estimating wind force without the use of instruments based on the visible effects of the wind on the physical environment. The behavior of smoke, waves, trees, etc., is rated on a 13 point scale. The scale was devised in 1805 by the British naval Commander Sir Francis Beaufort (1774-1857) and is still commonly used by mariners.

| Force | Description     | Kts   |
|-------|-----------------|-------|
| 0     | Calm            | 0     |
| 1     | Light Air       | 1-3   |
| 2     | Light Breeze    | 4-6   |
| 3     | Gentle Breeze   | 7-10  |
| 4     | Moderate Breeze | 11-16 |
| 5     | Fresh Breeze    | 17-21 |
| 6     | Strong Breeze   | 22-27 |
| 7     | Near Gale       | 28-33 |
| 8     | Gale            | 34-40 |
| 9     | Strong Gale     | 41-47 |
| 10    | Storm           | 48-55 |
| 11    | Violent Storm   | 56-63 |
| 12+   | Hurricane       | 64+   |

**WARRANTY & SERVICE**

**Warranty**

Your Kestrel is covered by a full parts and labor warranty for one year from your date of purchase. The provisions of this warranty do not apply to: a) batteries, whether contained in a unit or sold individually; b) units which have been subjected to misuse, negligence, accident or improper maintenance or application; c) humidity sensors damaged by excess contact with salt water; or d) units which have been repaired or altered by a party other than Nielsen-Kellerman's employees or agents without Nielsen-Kellerman's prior written consent. The warranty can be extended to two years by completing the registration form below.

**Parts and Service**

To order replacement parts for your Kestrel or obtain service please contact Nielsen-Kellerman or your original place of purchase.

Revised 4/3/04

**Please fill out the product registration below and mail it to: Kestrel Registration, 21 Creek Circle, Boothwyn, PA 19061.**

NAME: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

CITY: \_\_\_\_\_ STATE: \_\_\_\_\_ ZIP: \_\_\_\_\_

COUNTRY: \_\_\_\_\_ TELEPHONE NUMBER: \_\_\_\_\_

EMAIL ADDRESS: \_\_\_\_\_

SERIAL NUMBER: \_\_\_\_\_ DATE OF PURCHASE: \_\_\_\_\_

MODEL: 1000  2000  3000  4000

MALE:  FEMALE:

AGE: 18-24  25-36  37-48  49-56  57+

**SPECIFICATIONS**

**Accuracy**

(Within OPERATIONAL RANGE)

|                   |                        |
|-------------------|------------------------|
| Wind Speed        | ±3% of reading         |
| Temperature       | ±1°C                   |
| Wind Chill        | ±2°C                   |
| Relative Humidity | ±3% of scale           |
| Heat Stress       | ±3°C                   |
| Dewpoint          | ±3°C<br>(above 20% RH) |

**Units and Operational Range**

| Units               | Low End | High End |
|---------------------|---------|----------|
| Meters per Second   | 0.3     | 40       |
| Feet per Minute     | 59      | 7877     |
| Kilometers per Hour | 1.0     | 144      |
| Miles per Hour      | 0.7     | 89       |
| Knots               | 0.6     | 78       |
| Beaufort Force      | 1       | 13       |
| Celsius             | -29     | 70       |
| Fahrenheit          | -20     | 158      |
| Percent Humidity    | 5       | 95       |

**Response Time**

|   |           |
|---|-----------|
| Wind Speed  | 1 Second  |
| Temperature, Relative Humidity, Wind Chill, Heat Stress, Dewpoint | <1 Minute |

**Display**

Type: Reflective 4 digit LCD.

Digit Height: 9 mm. [0.36 in.].

Update: 1 second.

Temperature Limitations: Normal operation from -15°C to 50°C [5°F to 122°F]. Below -15°C [5°F] the display fluid will freeze. Above 50°C, the display will turn black. This is temporary and display will function properly when unit is returned to normal temps. Accurate readings may be taken by keeping the unit warmer than -15°C [5°F], or cooler than 50°C [122°F] and exposing it for the minimum time necessary to take a reading (less than one minute).

Auto Shutdown: After 45 minutes of no button presses.

**Environmental**

Sealing: Electronics enclosure IP67 – water resistant to 1 m. [3 ft.]. Floats.

Shock: Drop tested to 2 m. [6 ft.].

Storage Temperature: -30°C to 80°C [-22°F to 176°F].

**Physical**

Buttons: Three sealed tactile rubber buttons control all functions.

Battery: User-replaceable CR2032 coin cell. Typical life, 300 hours.

Impeller: 25 mm. [1 in.] diameter, sapphire bearings, light weight. User-replaceable impeller/housing assembly.

Case: Slip-on case prevents damage to display and moving parts.

Dimensions: Unit: 4.8 x 1.7 x 0.7 in [122 x 42 x 18 mm]; case: 4.8 x 1.9 x 1.1 (122 x 48 x 28 mm).

Weight: Unit 2.3 oz [65g]; case 1.3 oz [37 g].

For more information or more detailed specifications, please visit [www.nkhome.com](http://www.nkhome.com).

**ADDITIONAL INFORMATION**



What is a "Kestrel"? The American Kestrel is the smallest North American falcon. Beautiful and highly adaptable, it can be found virtually everywhere in North America. It is unique among falcons for its ability to both hover at very low speeds and dive at very high speeds.



Assembled in the USA. The Kestrel 3000 is protected by US Patents 5,783,753, 5,939,645 and 6,257,079. Other patents pending. Nielsen-Kellerman reserves the right to change product specifications. © 2004. Kestrel, the Kestrel logo, Pocket Weather, NK and the NK logo are trademarks of the Nielsen-Kellerman Co.



**NIELSEN-KELLERMAN**

21 Creek Circle, Boothwyn, PA 19061

Phone (610) 447-1555 • Fax (610) 447-1577

Web [www.nkhome.com](http://www.nkhome.com)

E-mail [kestrel@nkhome.com](mailto:kestrel@nkhome.com)

AVERAGE HOUSEHOLD INCOME: <\$25,000  \$26,000-45,000   
46,000-75,000  \$76,000-100,000  \$100,000+

WHERE DID YOU PURCHASE YOUR KESTREL?  
\_\_\_\_\_

HOW DID YOU LEARN ABOUT KESTREL POCKET WEATHER METERS?  
\_\_\_\_\_

PRIMARY USE (CAMPING, FIRE FIGHTING, AGRICULTURE, ETC.):  
\_\_\_\_\_

SECONDARY USE:  
\_\_\_\_\_

FAVORITE MAGAZINE:  
\_\_\_\_\_