

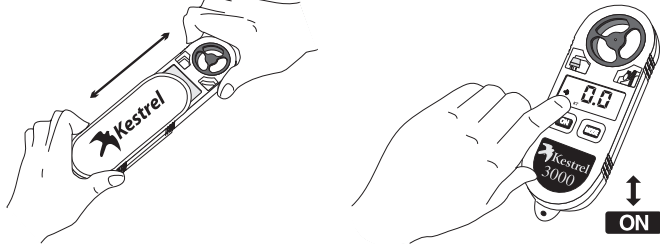
# NK Kestrel 3000 Pocket Weather Meter

Wind Speed, Temperature, Wind Chill, Relative Humidity, Heat Index and Dewpoint

## SPECIFICATIONS

### OPERATION

- 1) Slide off Cover. 2) Turn On: Press [ON] to turn on unit.



- 3) Select Operating Mode: Press and release [MODE] to change the operating mode. You can select a different operating mode at any time.

**MODE** (with up/down arrows)

0.0 KMH	0.0 KMH	0.0 KMH	26.3 °C
Current Wind Speed	MAX Maximum 3-Second Gust Since Power On	AVG Average Wind Speed Since Power On	Air Temperature
26.3 °C	66 %	28.5 °C	19.3 °C
Wind Chill	Relative Humidity	Heat Index	Dewpoint

- 4) Select Measurement Scale: Hold down [ON] while pressing [MODE] to change the measurement scale. You can select a different scale at any time.

**ON + MODE** (with up/down arrows)

B	KT	M/S	KM/H	MPH	FPM
Beaufort Force	Knots	Meters per Second	Kilometers per Hour	Miles per Hour	Feet per Minute (x10)
***NOTE*** Select temperature or wind chill mode to change degrees.		°C Degrees Centigrade	°F Degrees Fahrenheit		

- 5) Measure wind speed, max and average: Simply point the unit into the air flow you wish to measure.

**Measure temperature, wind chill, humidity and dew point:** The Kestrel's humidity and temperature sensors are located in the openings below the impeller. Because they are external to the case, you can take fast and accurate measurements by simply waving the unit rapidly back and forth OR holding it into an air flow of at least 1 M/S [2 KT, 4 KM/H, 2 MPH or 197 FPM] and reading the display immediately. (The air flow ensures that the temperature sensor measures the temperature of the air, not the case.) **Alternatively**, you can take accurate readings with no air flow by allowing the case to reach the same temperature as the surrounding air. (If the case is much warmer or cooler than the air, this can take up to 30 minutes.)



### Wind Speed Functions

**Operating Modes:** Moving 3-second average (), maximum 3-second gust since power on (MAX) and average since power on (AVG).

**Scales:** Knots (KT), meters per second (M/S), kilometers per hour (KM/H), miles per hour (MPH), feet per minute (FPM) and Beaufort (B).

**On-axis Accuracy:** greater of  $\pm 3\%$  or  $\pm$  least significant digit.

**Off-axis Response:**  $-1\%$  @  $5^\circ$ ,  $-2\%$  @  $10^\circ$ ,  $-3\%$  @  $15^\circ$ .

**Calibration Drift:**  $< 2\%$  after 100 hours use at 7 M/S [ $\sim 14$  KT, 25 KM/H, 16 MPH or 1400 FPM].

**Minimum Speed:** 0.3 M/S [ $\sim 0.6$  KT, 1.0 KM/H, 0.7 MPH or 59.0 FPM].

**Maximum Speed:** 40 M/S [ $\sim 78$  KT, 144 KM/H, 89 MPH or 7877 FPM].

### Temperature and Humidity Functions

**Operating Modes:** Temperature (); wind chill (); relative humidity (); heat index (); dewpoint temperature ().

**Scales:** Centigrade ( $^\circ\text{C}$ ), Fahrenheit ( $^\circ\text{F}$ ), percent (%).

**Accuracy:** Temperature and wind chill,  $\pm 1.0^\circ\text{C}$ ; relative humidity  $\pm 3\%$ , dew point temperature  $\pm 2^\circ\text{C}$  and heat index,  $\pm 3^\circ\text{C}$  (between 5% and 95% RH).

**Minimum Temperature:**  $-29^\circ\text{C}$  [ $-20^\circ\text{F}$ ].

**Maximum Temperature:**  $70^\circ\text{C}$  [ $158^\circ\text{F}$ ].

**Humidity Sensor Response Time:** 1 minute.

**Humidity Sensor Calibration:** May be field or factory calibrated.

### Display

**Type:** Reflective  $3\frac{1}{2}$  digit LCD.

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

**Update:** 1 second.

**Range and Resolution:** Depends on measurement scale selected—see chart:

Scale	Range	Resolution
KT, M/S, KM/H		
MPH, $^\circ\text{C}$ & $^\circ\text{F}$	0.0-199.9	0.1
FPM	0-1,999	1
	2,000-19,990	10
%	0-100	1

**Temperature Limitations:** Normal

operation from  $-15^\circ\text{C}$  to  $60^\circ\text{C}$  [ $-4^\circ\text{F}$  to  $140^\circ\text{F}$ ]. Below  $-15^\circ\text{C}$  [ $-4^\circ\text{F}$ ], accurate readings may be taken by keeping the unit warmer than  $-15^\circ\text{C}$  [ $4^\circ\text{F}$ ] and exposing it for the minimum time necessary to take a reading (less than one minute).

**Auto Shutdown:** After 30 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:**  $-40^\circ\text{C}$  to  $60^\circ\text{C}$  [ $-40^\circ\text{F}$  to  $140^\circ\text{F}$ ].

### Physical

**Buttons:** Two sealed tactile rubber buttons control all functions.

**Battery:** User-replaceable CR2032 coin cell. Typical life, 250 hours (25,000+ readings).

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

**Temperature Sensor:** Hermetically sealed precision thermistor.

**Humidity Sensor:** Solid state silicone capacitance sensor.

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

**Dimensions:** 122 x 42 x 14 mm. [4.8 x 1.7 x 0.6 in.]; case, 117 x 46 x 19 mm. [4.6 x 1.8 x 0.7 in.]; lanyard, 0.5 m. [10 in.].

**Weight:** Unit, 43 g. [1.5 oz.]; case, 23 g. [0.8 oz.].

The Kestrel turns itself off automatically after 30 minutes of no button presses.

## MAINTENANCE & TROUBLESHOOTING

### Storing Your Kestrel

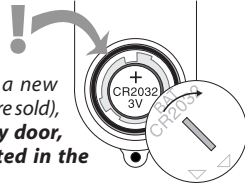
Avoid storing your Kestrel where it will be exposed to temperatures below -20°C [-4°F] or above 80°C [176°F] for extended periods of time. Doing so may permanently damage the LCD, electronics, battery or enclosure. (Note that the inside of a car parked in the hot sun can reach very high temperatures.) If the temperature of the actual LCD of your unit exceeds 70°C [158°F], it will temporarily become solid black until it cools down to below this temperature.

### Use of the Lanyard and Cover

Your Kestrel is shipped with the slip-on cover on the lanyard to prevent loss. If you prefer to be able to remove the cover entirely, open the lanyard end cap with a small screw driver, then remove the slip-lock. Slide the cover completely off the lanyard, then reassemble the slip-lock and lanyard end cap as before.

### Replacing the Battery

When your display flashes "bAt" in temperature or humidity modes, 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.**

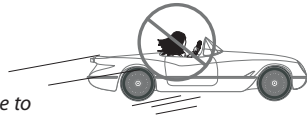


### Why does the Impeller Appear Imbalanced?

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 windspeed 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  $\pm 3\%$ .

### 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. If you require accurate high AND low speed measurements, we recommend a second impeller.



### Troubleshooting a Damaged Impeller

If the impeller rotates, but only shows "0" or "-" on the display, the impeller may no longer be sending a signal to the unit. Test the unit by turning it on and placing it near an electromagnetic source (i.e. back of computer monitor or TV). If the display shows any number other than "0" or "-", **the unit does not need to be returned** but does need a new impeller. Contact Nielsen-Kellerman or your place of purchase to order a replacement.

### 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.**



### Why Does the Humidity Display Show "-- --"?

It takes a few seconds for the humidity sensor to register a humidity value. The display will show "-- --" until it does.

### Care of the Humidity Sensor

The humidity sensor has been factory calibrated to be accurate to within  $\pm 3\%$ . If your Kestrel appears to no longer meet this specification, it may need to be recalibrated. 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 (1774-1875) 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+

## WIND CHILL, HEAT INDEX & DEWPOINT

The Kestrel 3000 automatically calculates wind chill, heat index and dew point. These values provide useful guidance when preparing for outdoor activities. For more information about the derivation and meaning of these values, visit [www.nkhome.com](http://www.nkhome.com).

- "Wind chill" provides an indication of how cold it feels given the combined effects of the actual air temperature and the wind speed. Wind Chill based on National Weather Service standards as of November 1, 2001.
- The "heat index" indicates how hot it feels when the effects of relative humidity are combined with the actual air temperature. The heat index was developed by the National Weather Service to help people avoid heat illness. Prolonged exposure and/or physical activity when the heat index is above 105°F [41°C] is likely to lead to sunstroke, heat cramps, heat exhaustion and even death in susceptible individuals.
- The "dewpoint" or "dewpoint temperature" is the temperature to which the air must be cooled to observe liquid water condensation, or dew. If the air is very saturated (high relative humidity), the dew point will be only a little lower than the air temperature. If the air is very dry, the air would have to be cooled a great deal before observing condensation, so the dewpoint is low.

## 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.

### Parts and Service

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



## 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.

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