SENSOR	1000	2000	2500	3000	3500	3500 DT	4000	4200	4250	4300	4400	4500	4500 HOR	ACCURACY (+/-)*	RESOLUTION	SPECIFICATION RANGE	OPERATIONAL RANGE	NOTES
Wind Speed   Air Flow	•	•	•	•	•	•	•	•	٠	•	•	•	9	Larger of 3% of reading, least significant digit or 20 fibrrin	0.1 m/s 1 tt/min 0.1 km/h 0.1 mph 0.1 knots 1 B	0.6 to 40.0 m/s 118 to 7,874 fb/min 2.2 to 144.0 km/h 1.3 to 89.5 mph 1.2 to 77.8 knots 0 to 12 B	0.6 to 60.0 m/s 118 to 11,811 ft/min 2.2 to 216.0 km/h 1.3 to 134.2 mph 1.2 to 116.6 knots 0 to 12 B	1 inclp25 mm diamater impoler vilil precision auto and lew firsticin Zystib bearings. Startup stated as lower intri, readings may be taken down to 0.4 m/s [79 firmin   1.5 km/h]. 3 m/h after impoler startup. Off-sals accuracy -1% @5° off-sals; -2% @ [10°, -3% @ 15°. Calibra drift = 1% after 100 hours use at 18 MMH / 17 ms. Replacement impoler (NK PK-0600) filed instals without look (US Patient 5/28,753), Wind speed calibration and testing should be d with triangle on impoler located at the top front face of the Kestrel.
Ambient Temperature		•	•	•	•	•	•	٠	•	•	•	•	•	0.9 °F 0.5 °C	0.1 *F 0.1 *G	-20.0 to 158.0 °F -29.0 to 70.0 °C	14.0.0 to 131.0 °F -10.0 to 55.0 °C	Hermicaly-solod, precision thermister mounted externally and thermally isolated (US Ps. 5538,645) for rapid responses. Arithover (2.2 mph) miss or greater provides fastest response reduction of insolation effect. Catibration offit negligible. Thermister may also be used to me temperature of vester or snowby submerging thermistor portion into material - remove imperior to taking submerging disassements and ensure thursdip sensor membrane is free of valor prior to taking humidity based massurements after submorsion.
Globe Temperature - Tg		2.004.000									•			"F 1.4 "C	0.1 °F 0.1 °C	-20.0 to 140.0 °F -29.0 to 60.0 °C	14.0 to 131.0 °F -10.0 to 55.0 °C	Temporature inside 1in;25 mm black powder coated copper globe converted to Tg equivale standard 6 in;150 mm globe. Closest equivalence obtained with pirflow greater than 2.2 mpl m/s.
Relative Humidity				٠	•	•	•	•	•	•	•	•	•	3.D %RH	0.1 %RH	5 to 95% non-condensing	0 to 100%	Polymer capacitive hurridity sensor mounted in thin-walled chamber external to case for ra- accurate response (US Patent 8,237,074,). To achieve statistic documer, unit must be permit capalizatio to external temperature when exposed to large, rapid temperature changes and out of direct sanight. Calization of rit +2.2% over 24 mands. Hurridly sensor ray be reca at factory or in float using Realted Hurridity Calization of (NK PR-40802).
Pressure		arron all sopre	•			•	•	٠	•	٥	•	•	•	0.03 inHg 1.0 hPa mbar 0.01 PSI	0.01 inHg 0.1 hPa mbar 0.01 PSI	8.86 to 32.49 inHg 300.0 to 1100.0 hPalmbar 4.35 to 15.95 PSI and 32.0 to 185.0 *F 0.0 to 85.0 *C	0.30 to 48.87 inHg 10.0 to 1654.7 hPa mbar 0.14 to 24.00 PSI and 14.0 to 131.0 °F -10.0 to 55.0 °C	Monothic silicon piezarosistine pressure somet with second-order temperature correction Pressure sensor may be receilibrated a factory or in field. Adjustable reforemce attitude and display of station pressure or barometric pressure corrected to MSL. Kostinel 4200 display of station pressure and edicitated section. Restrate 2500 and \$500 display continuously update three-hour barometric pressure trend indicator; ricing rapidity, rising, steady, falling, falling or Restret 4000 series displays pressure trend through graphing function. PSI display on Kest 4000 series only.
Compass						7					Morning to the Control of the Contro	•	•	5*	1* 1/16th Cordinal Scale	0 to 360*	0 to 360*	2-axis sold-table magnetoratible sensor munifol perpendicular to unit plane. Accuracy cancer dependent upon units verifica position. Self-charation rotion de inferioda reagnetic from batteries or unit and must be run after every full power-down (battery removal or chara Readout indicates direction to which the back of the unit is pointed when held in a vertical orientation. Declaration/variation adjustable for True North readout.
MEASUREMENT	1000	2000	2500	3000	3500	3500 DT	4000	4200	4250	4300	4400	4500	4500 HOR	CALCUI	ATED ME	ASUREMENTS SPECIFICATION RANGE	SENSORS EMPLOYED	NOTES
Air Density								•	•					0.0002 lb/lt <sup>3</sup> 0.0033 kg/m <sup>3</sup>	0.001 lbs/ft <sup>2</sup> 0.001 kg/m <sup>3</sup>	Refer to Ranges for Sensors Employed	Temperature Relative Humidity Pressure	Mass of air per unit volume
Air Flow								•						6,71%	1 cfm 1 m²/hr 1 m²/m 0.1m²/s	Refer to Ranges for Sensors Employed	Air Flow Usor Input (Duct Shape & Size)	Volume of air llowing through an opening. Automatically calculated from Air Velocity measured user-specified duct shape (circle or rectangle) and dimensions (units: In, ft, cmor m). Maximum duct dimension input: 258.0 in   21.5 ft   655.3 cm   6.55 m.
Allitude		#1147.W	•		•	•	6	•	•	•		•	•	typical: 23,6 ft 7.2 m max: 48.2 ft 14,7 m	1.Us 1 ft 1 m	typical: 750 to 1100 mBar max: 300 to 750 mBar	Pressure User Input (Reference Pressure)	Height above Mean Soa Level ("MSL"). Temperature compensated pressure (barometric) altimater requires accurate reference barometric pressure to produce maximum absolute accuracy. Both accuracy specs corresponds to a reference pressure anywhere from 850 mBar.
Barometric Pressure			•	of the company of the control of	•	•	•	•	•	•	•	•	•	0,07 inHg 2.4 hPa mbar 0.03 PSI	0.01 inHg 0.1 hPajmbar 0.01 PSI	Refer to Ranges for Sensors Employed	Pressure User Input (Reference Atitude)	Air pressure that would be present in identical conditions at MSL. Station pressure compet for local elevation provided by reference allitude. Requires accurate reference altitude to maximum absolute accuracy.
Crosswind & Headwind/Tallwind									and the second s	-				7.1%	1 mph 1 f/min 6.1 km/h 0.1 m/s 0.1 knots	Refer to Ranges for Sensors Employed	Wind Speed Compass	Effective wind relative to a target or travel direction. Auto-switching headwindtalkvind indic
Delta T			-			•						-	-	3.2 °F 1.8 °C	0.1 °F 0.1 °C	Refer to Ranges for Sensors Employed	Temperature Relative Humidity Pressure	Difference between dry bub temperature and wet bulb temperature. When spraying, Indic evaporation rate and droplet if otime. Safe range for posticide spraying is 4 to 16 °F / 2 to
Density Altitude							•	•	•	•	•	•	•	226 ft 69 m	1 ft 1 m	Refer to Ranges for Sensors Employed	Temperature Relative Hurridity Pressure	Local air density converted to equivalent elevation above sea level in a uniform layer continue international Standard Atmosphere.
Dewpoint				•	•	•	•	•	•		•	•	•	3.4 °F 1.9 °C	0.1 °F 0.1 °C	15 to 95 % RH Refer to Range for Temperature Sensor	Temperature Relative Humidity	Temperature that a volume of air must be cooled to at constant pressure for the water value present to condense into developed form on a solid surface. Can also be considered to be water-to-air saturation temperature.
Evaporation Rate	reneero e lire		d Norda in-			redonate exact				•				0.01 lb/ft <sup>2</sup> /hr 0.06 kg/m2/hr	0.01 ២/ម៉ោរ 0.01 kg/ភា <sup>2</sup> /hr	Refer to Ranges for Sensors Employed	Wind Speed Temperature Relative Humidity Pressure User Input (Concrete Temperature)	The rate at which misture is but from the surface of curing concrote. Requires user measurement and only of concrete temperature obtained with an accurate IR or probe thermometer (Fe r C, on tricklode). Readings should be taken 20 inches above pour su with the thermister shaded, and averaged of e f-10 second using built-in averaging function.
Heat Index	road Lorriet		•		•		•	•	•	•	•	•	•	7.1 °F 4.0 °C	0.1 °F 0.1 °C	Refer to Ranges for Sensors Employed	Temperature Rolative Humidity	Perceived temperature resulting from the combined effect of temperature and relative hut Calculated based on NWS Heat Index (Hi) tables. Measurement range limited by extent causished tables.
Moisture Content   Humidity Ratio ("Grains")	destinit est, ce e	i reenan		ļ.,			dizi-in	•	•	- Landing and	<u> </u>		- Continue and	.3 gpp .04	0.1 gpp 0.01 g/kg	Refer to Ranges for Sensors Employed	Temporature Relative Humidity Pressure	Mass of vater vapor in a mass of air.
Relative Air Density				1	1				•					0,3%	0.1%	Refer to Ranges for Sensors Employed	Temperature Relative Humidity Pressure	The ratio, expressed as a percentage, of measured air density to the air density of a star atmosphere as defined by the ICAO.
Thermal Work Limit (TWL)						İ					•			10.9 W/m²	0.1 W/m²	Refer to Ranges for Sensors Employed	Wind Speed Temperature Globe Temperature Relative Humidiy Pressure	Estimolod safe maximum condinuously sustainable human metabolic rate (Win2) for the conditions and cibiling factors. Based off of estimated metabolic output of typical human screen zone warnings.
Outdoor Wet Bulb Globe Temperature (WBGT)											•			1.3 *F 0.7 *C	0.1 °F 0.1 °C	Refer to Ranges for Sensors Employed	Wind Speed Temperature Globo Temperature Relative Humidity Pressure	Measure of human heat stress defined as the combination of effects due to radiation, co and conduction. Outdoor WBGT is calculated from a weighted sum of natural wet bub (i' globe temperature (Tg), and dry bub temperature (Td). User settable on-screen warning.
Wet Bulb Temperature - Naturally Aspirated (Triwb)											•			1.4 °F 0.6 °C	0.1 °F 0.1 °C	Refer to Ranges for Sensors Employed	Wind Speed Temperature Globe Temperature Relative Humidity Pressure	Similar to psychrometric wal-bub temperature (see below). However, Trivib only undergo- convection from the ambient air velocity. Trivib is a measure of the evaporative cooling the will allow. This is accounted for by combining the effects of, mainly, relative humidity and windspeed.
Wet Bulb Temperature - Psychrometric					•	•		•	•	•	•	•	G	3.2 °F 1.8 °C	0.1 °F 0.1 °C	Refer to Ranges for Sensors Employed	Temperature Relative Humidity Pressure	Temperature indicated by a sing psychrometer. Due to nature of the psychrometric ratio votor-all system, this approximates the thermodynamic work-bub temperature. The therm work-bub temperature is the temperature a parent of air would have if cooked acia batically saturation temperature via vater evaporating into it.
Wind Chill		٠	•	•	•							•	•	1.6 °F 0.9 °C	0.1 °F 0.1 °C	Refer to Ranges for Sensors Employed	Wind Speed Temperature	Perceived temperature resulting from combined effect of wind speed and temperature, C based on the NWS Wind Chil Temperature (WCT) Indox, revised 2001, with wind speed by a factor of 1.5 is pixel equivalent results to w
	•	•		•			Ţ							Reflective 3 1/2 digit I	.CD. Digit height 0.36 k	CIFICATIONS 1/9 mm. Aviation green electro	oluminescent backlight. Manual activati	on with auto-off.
Display & Backlight Response Time		-	-						•					Multifunction, multi-dig All measurements exc	it monochrome dot-ma ept those based on rel	trix display. Choice of aviation ative hurricity respond accurat	i green or visible red (NV models only) tely within 1 second. Retative humidity a	luminescent backlight. Manual activation with auto-off. electroluminescent backlight. Automatic or manual activation. Ind all measuroments which include RH in their calculation may require as long as 1 minute t
& Display Update Max/Avg Wind								N EMPLOY						One-button clear and Max and average win	hange in the measurer restart of Max Wind Go d calculation may be sta	ment environment. Display upd ust and Average Wind measure	ates every 1 second. errent.	with all other wind-related functions: air velocity, crosswind, headwind/tailwind, wind chill, W
Data Storage & Graphical Display, Min/Max/Avg History							4000		9 3200 s point	3600	2300	2900	2500	independently Auto-s	verage and logged his	tory stored and displayed for e	very measured value. Large capacity d enwrite on or off. Logs even when displa	ata legger with graphical display. Manual and auto data storage. Min/Max/Avg history may b y off except for 2 and 5 second intervats (code version 4.18 and later). Data capacity show
Data Upload & Bluetooth® Data Connect Option		demon	in annual control	- in-year		V-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1	•				•	er sturyst	•	Bluetooth Data Tra	nsfer Option: Adjusta	232) or Bluetooth data transfe ble power consumption and ra- serial Port Protocol for data tra		dividual unit ID and 4-digit PIN code proprogrammed for easy identification and data securit
Clock / Calendar		e de reset	-				24 1270 W.O.				***************************************	10175000	er er er er er er	Requires optional PC Requires optional PC	interface (USB or RS- interface (USB or RS-	232) or Eluctooth data transfe 232) or Eluctooth data transfe	er option and provided software. er option and provided software,	
Auto Shutdown Languages			•	•		•					0			Requires optional PC English, French, Gerr	interface (USB or RS- ran, Italian, Spanish.	232) or Bluetooth data transfe	er aption and provided software, or aption and provided software.	
Certifications Origin								2 2 2					•	CE certified, RoHS a Designed and manufa	nd WEEE compliant. In actured in the USA from	uS and imported components	able standards (written certificate of tes s. Comples with Regional Value Contes ckight use in 2000 to 3500 models.	its available at additional charge). ni and Tarrif Code Transformation requirements for NAFTA Preference Criterion B.
Battery Life Shock Resistance							13							Standard Models: A MIL-STD-810g, Tran	VAA Alkaline, two, included alt Shock, Method 516.	led. Average life, 400 hours of	ruse, reduced by backlight or Bluetooth ct may damage replaceable impeller.	radio transmission use.
Sealing Operational Temperature Limits		•						1:	:		:	•		to the more extreme	°C to 55 °C Measuren	ents may be taken beyond the inum time necessary to take r		ange of the display and batteries by maintaining the unit within the operational range and ex
Storage Temperature		•		.0		. 0	1			1 .	•			-22.0 °F to 140.0 °F 4.8 x 1.9 x 1.1 ln / 12				





This instrument was produced under rigorous factory production control and documented standard procedures. It was individually visually inspected, leak tested and function tested for display, backlight, button and software performance. The accuracy of each of its primary measurements was individually calibrated and/or tested against standards traceable to the National Institute of Standards and Technology ("NIST") or calibrated intermediary standards. This instrument is certified to have performed at the time of manufacture in compliance with the following specifications as they apply to this meter's specific model, measurements and features.

# Methods Used in Calibration and Testing

## Wind Speed:

The Kestrel Pocket Weather Meter impeller installed in this unit was individually tested in a subsonic wind tunnel operating at approximately 300 fpm (1.5 m/s) and 1200 fpm (6.1 m/s) monitored by a Gill Instruments Model 1350 ultrasonic time-of-flight anemometer. The Standard's maximum combined uncertainty is +/-1.04% within the airspeed range 706.6 to 3923.9 fpm (3.59 to 19.93 m/s), and +/-1.66% within the airspeed range 166.6 to 706.6 fpm (0.85 to 3.59 m/s).

### Temperature:

Temperature response is verified in comparison with a Eutechnics 4600 Precision Thermometer or a standard Kestrel 4000 Weather and Environmental Meter calibrated weekly against the Eutechnics 4600. The Eutechnics 4600 is calibrated annually and is traceable to NIST with a system accuracy of +/- 0.05 °C.

# **Direction / Heading**

The sensitivity of the magnetic directional sensor is verfied at the component level by applying a magnetic field to the sensor and measuring the signal output at 4 points, as well as after assembly by orienting the unit to the cardinal directions and measuring the magnetic field output. In both cases the compass output must be accurate to within +/- 5 degrees.

## Relative Humidity:

Relative humidity receives a two-point calibration in humidity and temperature controlled chambers at 75.3% RH and 32.8% RH at 25° C. The calibration tanks are monitored with an Edgetech Model 2002 DewPrime II Standard Chilled Mirror Hygrometer. Following calibration, performance is further verified at an RH of approximately 43.2% against the Edgetech Hygrometer. The Edgetech Hygrometer is calibrated annually and is traceable to NIST with a maximum relative expanded uncertainty of +/- 0.2% RH.

### **Barometric Pressure:**

Pressure response is verified against a Mensor Series 6000 Digital Barometer or a standard Kestrel 4000 Weather and Environmental Meter calibrated weekly against the Mensor Barometer. The Mensor Barometer is calibrated annually and is traceable to NIST with a maximum relative expanded uncertainty of +/- 0.02% F.S.

Approved By:

Michael Naughton, Engineering Manager