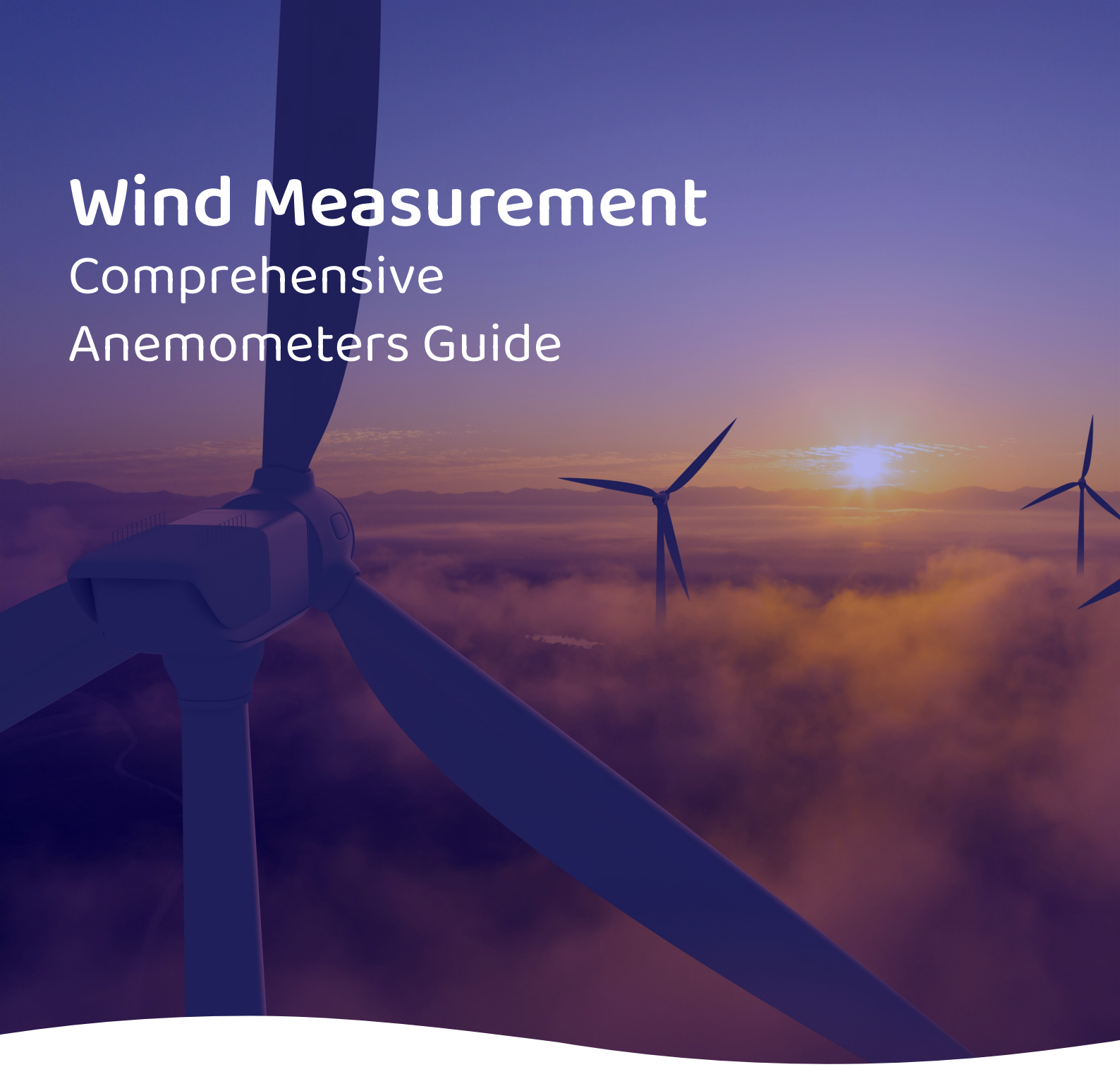


Wind Measurement

Comprehensive Anemometers Guide

ACCURATE WIND MEASUREMENTS
A COMPLETE RANGE FOR ANY APPLICATION

senseca

		ULTRASONIC ANEMOMETERS						ULTRASONIC ANEMOMETERS						
Type		**2-Axis Basic**	**2-Axis Multiparametric & Multi Output**					**2-Axis High Performance**				**2-Axis Harsh Environments**	**3-Axis**	
Model		**HD53LS...**	**HD52.3D** **HD52.3D*4***	**HD52.3DP** **HD52.3DP*4***	**HD52.3D17** **HD52.3D1*47***	**HD52.3DP17** **HD52.3DP1*47***	**HD52.3DT147**	**HD51.3D** **HD51.3D*4***	**HD51.3DP** **HD51.3DP*4***	**HD51.3D17** **HD51.3D1*47***	**HD51.3DP17** **HD51.3DP1*47***	**HD51.3D-AL** **HD51.3D*4*-AL**	**WUS30F**	**HD2003**
														
Measured parameters		Wind direction Wind speed	Wind direction Wind speed *Atm. pressure*	Wind direction Wind speed Solar radiation *Atm. pressure*	Wind direction Wind speed Temperature Humidity *Atm. pressure*	Wind direction Wind speed Temperature Humidity Solar Radiation *Atm. pressure*	Wind direction Wind speed Temper-ature Humidity Precipitation Atm. pressure	Wind direction Wind speed *Atm. pressure*	Wind direction Wind speed Solar radiation *Atm. pressure*	Wind direction Wind speed Temperature Humidity *Atm. pressure*	Wind direction Wind speed Temperature Humidity Solar Radiation *Atm. pressure*	Wind direction Wind speed *Atm. pressure*	Wind direction Wind speed Atm. pressure	Wind direction Wind speed Temperature Humidity Atm. pressure
SPEED	Measuring range up to	0...50 m/s	0...60 m/s				0...50 m/s	0...85 m/s		0...75 m/s		0...80 m/s	0...85 m/s	0...70 m/s
	Resolution	0.01 m/s						0.01					0.01 m/s	
	Accuracy	± 0.2 m/s or ± 2%, the greatest (0...35 m/s), ± 3% (> 35 m/s)						± 0.2 m/s or ± 2% of measure, the greatest (0...65 m/s) ± 3% of measure (> 65 m/s)						±1% of reading
	Survival speed	90 m/s					60 m/s	90 m/s				100 m/s	100 m/s	90 m/s
DIRECTION	Measuring range	0...359.9°						0...359.9°					Azimuth: 0...360° Elevation: ± 60°	
	Resolution	0.1°						0.1°					0.1°	
	Accuracy	± 2° RMSE from 1.0 m/s						± 2° RMSE (wind speed > 2 m/s)					± 2° RMSE (2 m/s < wind speed < 65 m/s) ± 3° RMSE (wind speed > 65 m/s)	± 1°
Average wind output		√	√					√					√	√
Wind gust		only version with RS485 MODBUS-RTU	√					√					√	√
Tilt angles		NO	NO					√ (opt.)					√	NO
Internal compass		√	√					√ (opt.)					NO	√
Analog outputs		current or voltage or RS485 MODBUS-RTU	2 analog outputs, for wind speed and direction or for velocity U-V cartesian components. Output 4...20 mA standard, on request 0...1 V, 0...5 V or 0...10 V					2 analog outputs, for wind speed and direction or for velocity U-V cartesian components. Output 4...20 mA standard, on request 0...1 V, 0...5 V or 0...10 V					3 isolated analog outputs. Output type: 0/4...20 mA, 0...1 V, 0...5 V or 0...10 V	5 components output, 4...20 mA, 0-1/0-5/ 0-10/1-5 V
Serial outputs			RS232, RS485, RS422 and SDI-12					Isolated RS232, RS485 and RS422					Isolated RS232, RS485, RS422 and SDI-12	RS232C, RS485, RS422
Communication protocol		MODBUS-RTU	NMEA, MODBUS-RTU, SDI-12 and proprietary RS232 and RS485					NMEA, MODBUS-RTU, ASCII proprietary					NMEA, Modbus-RTU, SDI-12, ASCII proprietary	MODBUS RTU, RS485 Multidrop and AoXnd half duplex
Power supply		10...30 Vdc (15...30 Vdc for versions with 0...10 V analog output)						12...30 Vdc (15...30 Vdc for versions with 0...10 V analog output)					12...30 Vdc (15...30 Vdc for 0...10 V output)	12...30 Vdc
Power consumption		26 mA @ 24 Vdc	26 mA @ 24 Vdc without heater - 8 W @ 24 Vdc with heater					60 mA @ 24 Vdc without heater 20 W @ 24 Vdc with heater - 93 W with heater for '-AL' versions					105 W @ 24 Vdc	<2 W (without heater) <6 W (with heater)
Working temperature		-20...+55 °C	-40...+70 °C				1...+70 °C	-40...+70 °C / -50...+70 °C for '-AL' versions					-40...+70 °C	-40...+60 °C
Protection degree		IP66						IP66					IP67	IP64
Anti-corrosion test		NO	EN ISO 9227:2023				NO	NO				MIL-STD-810G Method 509.6 (48 hours of exposure + 48 hours of drying) EN ISO 9227:2017		NO
Vibration resistance test		NO	NO					NO				60068-2-6:2008 IEC 60068-2-6:2007		NO
Anti-icing/freezing rain test		NO	NO					NO				MIL-STD-810F Method 521.2		NO
Analog outputs refresh rate		1 Hz						4 Hz					4 Hz	1-20 Hz
Digital output rate		1 Hz						1 Hz					1 Hz	1-50 Hz
Housing material		ASA with aluminum and AISI 316 metal parts						ASA with aluminum and AISI 316 metal parts				Anodized aluminium alloy, AISI 316	AISI 316	Plastic and AISI316 stainless steel

Our Services

ISO 17025 AIR SPEED LABORATORY

Our in-house ISO 17025 accredited Air Speed Laboratory is equipped with two Göttinger-type wind tunnels, specifically designed to guarantee excellent metrological performance in terms of stability and flow uniformity. These facilities allow for the precise calibration of a wide range of anemometers, including hot-wire anemometers, Pitot and Darcy tubes, wind vanes, ultrasonic anemometers (biaxial and triaxial), and cup anemometers.

To ensure the highest level of measurement accuracy, each tunnel is fitted with a Laser Doppler Anemometer (LDA), which serves as the most advanced reference standard available today.

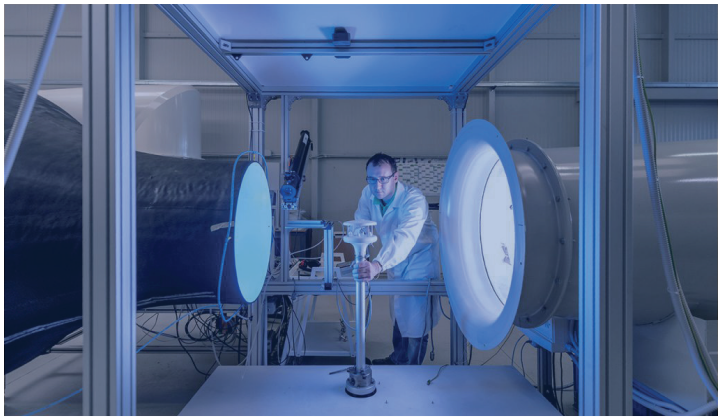
The GV1 wind tunnel supports calibrations within a velocity range of 1 to 60 meters per second. Featuring a 600 mm circular test section and driven by a 50 kW DC motor, this tunnel is ideal for the calibration of ultrasonic anemometers (both biaxial and triaxial), cup anemometers, Pitot and Darcy tubes, as well as vane probes with a cross-sectional diameter greater than 60 mm.

Senseca ISO 17025 Calibration Center is accredited for:

- Photo-radiometry
- Temperature
- Humidity
- Pressure
- Air speed
- Acoustic

The GV3 wind tunnel, with a 320 mm circular test section, is designed for lower speed calibrations ranging from 0.1 to 35 meters per second. It is particularly well suited for hot-wire anemometers and vane probes with diameters up to 60 mm.

In addition to velocity calibration, the laboratory also provides Calibration Reports for wind direction measurement.



senseca

Senseca Italy Srl
Via G. Marconi, 5
35030 Selvazzano Dentro (PD)
ITALY

www.environmental.senseca.com