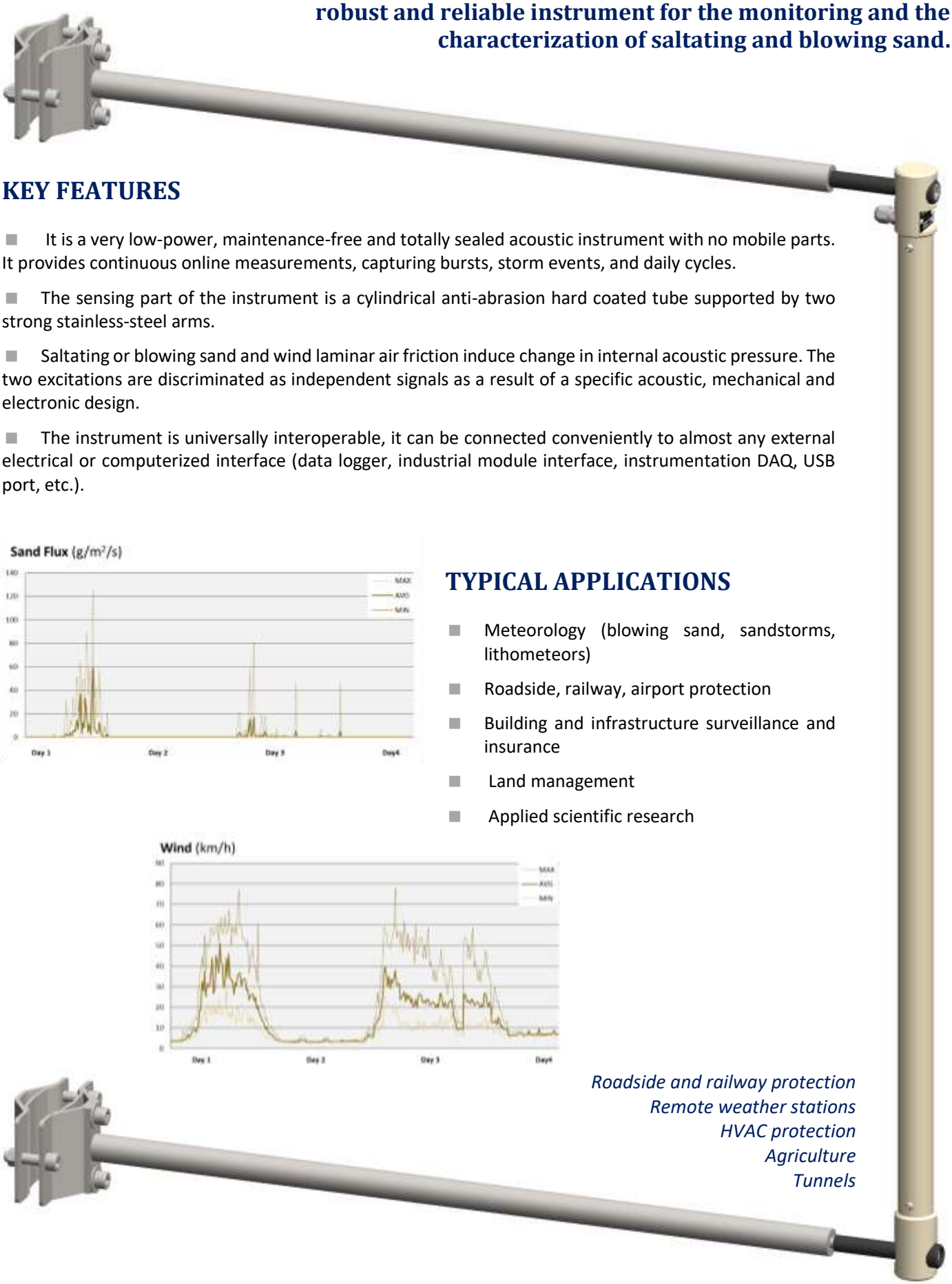
SandFlow SF4

Windblown Sand Monitoring Sensor

SandFlow™ SF4 is an advanced electro-acoustic device designed specifically to monitor real-time aeolian sand fluxes and wind speed. It is an extremely robust and reliable instrument for the monitoring and the characterization of saltating and blowing sand.



KEY FEATURES

- It is a very low-power, maintenance-free and totally sealed acoustic instrument with no mobile parts. It provides continuous online measurements, capturing bursts, storm events, and daily cycles.
- The sensing part of the instrument is a cylindrical anti-abrasion hard coated tube supported by two strong stainless-steel arms.
- Saltating or blowing sand and wind laminar air friction induce change in internal acoustic pressure. The two excitations are discriminated as independent signals as a result of a specific acoustic, mechanical and electronic design.
- The instrument is universally interoperable, it can be connected conveniently to almost any external electrical or computerized interface (data logger, industrial module interface, instrumentation DAQ, USB port, etc.).

TYPICAL APPLICATIONS

- Meteorology (blowing sand, sandstorms, lithometeors)
- Roadside, railway, airport protection
- Building and infrastructure surveillance and insurance
- Land management
- Applied scientific research

Roadside and railway protection
Remote weather stations
HVAC protection
Agriculture
Tunnels

SPECIFICATIONS

Measuring characteristics	
Measuring surface	Ø32 × 920 mm cylindrical tube
Physical phenomena detected by the instrument	**Flux** of solid particles transported by the wind (aeolian sand transport, and more generally all kind of solid particle fluxes of the same range of kinetic energy generating **impacts** on the measuring surface). **Wind** speed (more generally, an estimation of the average speed of the laminar aeolian flux generating **friction** on measuring surface).
Measurement accuracy	**Flux:** For a given controlled flux homogeneously distributed along the measuring surface of the instrument (such as particles of a given shape profile, density, Young modulus, falling speed and incidence angle), the response of the instrument varies of ± 5% and the variability between two instruments is below ± 10%. **Wind:** In laminar established conditions and without external parasitic turbulences or low-frequency noise, the wind speed accuracy is ± 15%.
Particle velocity	Not measured. Can only be an interpretation of the wind speed measurement.

Voltage ranges and measuring scales	
Voltage outputs	Continuous analog voltage or pulse analog voltage, user selectable +0 to +2.5V or +0 to +5V are available. Pulse threshold, integrator timeout and duration are also user selectable. The continuous analog voltage persists on the outputs so that output voltages can be read at any time.
Wind speed scaling	Sensitivity @voltage range +2.5V: [10 mV/(km/h)] i.e. +2.5V corresponds to 250 km/h
	Sensitivity @voltage range +5V: [20 mV/(km/h)] i.e. +5V corresponds to 250 km/h
Particles flux scaling	Sensitivity @voltage range +2.5V: [10 mV/(g/m^2/s)] i.e. +2.5V corresponds to 250 g/m^2/s
	Sensitivity @voltage range +5V: [20 mV/(g/m^2/s)] i.e. +5V corresponds to 250 g/m^2/s

Mechanical data	
Material	Plastic and aluminum
Installation	Universal mounting kit provided (ordering reference: FCBRA)
Weight	1 kg without mounting kit 5 kg with mounting kit
Dimensions (H×W×D)	Sensor alone: 1040 mm × ∅32 mm With mounting kit: 1040 mm × 874 mm × 40 mm

Supply	Ratings
Voltage	6 V to 30 V DC (9.6 V and 16 V DC in case of powering through the SDI-12 terminals)
Current	< 1 mA in stand-by mode and 20 mA max in acquisition mode. For a typical nominal duty-cycle of 10%: 2.1 mA (20 mA for duty-cycle of 100%).

Interfaces	
Analog	Pulse and continuous (and persistent) voltages, 0-2.5V or 0-5V
SDI-12	Yes, 1.3 certified (fully complies with the NR Systems SDI-12 Verifier)
Serial 3V3 TTL	Yes
Modbus RTU (RS485)	Yes, with the Modbus adapter accessory

Environmental conditions	
Temperature range	-40°C to +80°C. Can even operate over this range.
Relative humidity	0 to 100%
Protection	IP67
Standards	EN 61326-1: 2013, CE compliant 2014/30/EU, CE compliant

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