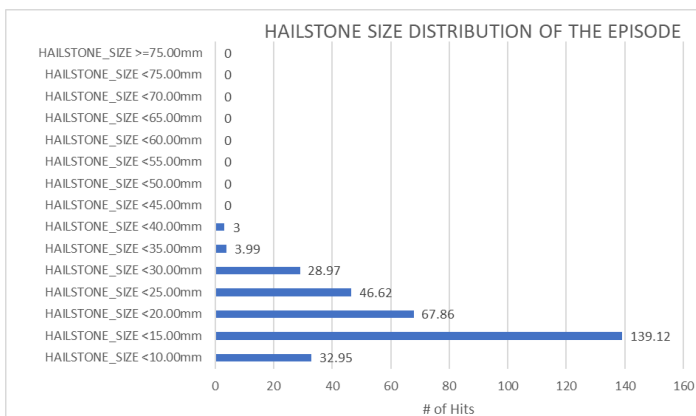
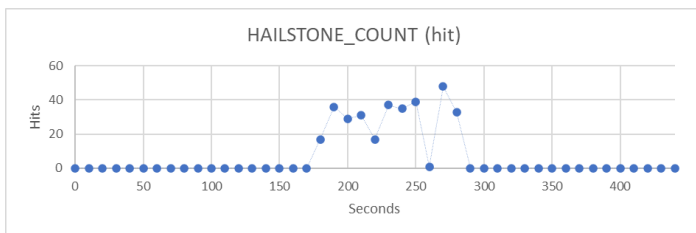
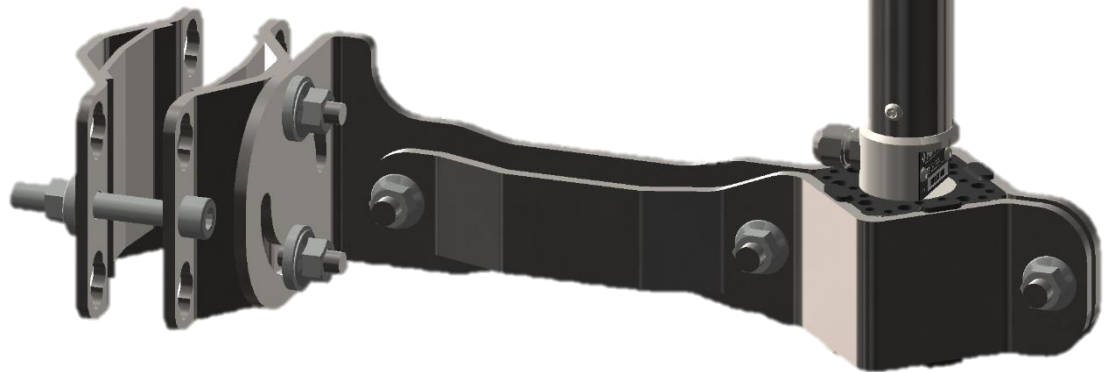


HailFlow™ HF4 is an acoustic sensing instrument which operating principle is the detection of the kinetic energy of the hydrometeors impact on its sensing disk head, in particular the hailstones. It is an extremely robust and reliable instrument for the monitoring of hail and the characterization of hailstone sizes.

KEY FEATURES

- It detects hailstones up to 7.5 cm diameter and will survive the most extreme environmental conditions, including off-shore and extreme wind situations.
- The universal fastening mounting kit is an unbreakable plain high grade stainless-steel arm with tiltable V- Brackets.
- The sensing element of this non-moving-part instrument is a plain high grade stainless-steel head.
- Impacts of hailstones (or any other lithometeors in the same range of kinetic energy) on this sensing head induce a measurable change in the acoustic pressure of an internal cavity of the sealed body of the instrument.
- It is not sensitive to rain thus the instrument output cannot be biased by rain, splashes or other liquid precipitation or aeolian transported events.



TYPICAL APPLICATIONS

- Meteorology (hail, solid precipitation, lithometeors)
- High resolution hail monitoring and warning
- Building and infrastructure surveillance and insurance
- Agriculture
- Maritime and offshore applications (wind turbines, buoys)
- Roadside, railway, airport protection
- Land management
- Applied scientific research

SPECIFICATIONS

Measuring characteristics	
Measuring surface	200 mm outer diameter disc
Precipitation detected by the instrument	Solid only (hail). 15 classes, from 0.5 cm (minimal detectable diameter) to ≥ 7.5 cm (possible saturation of the instrument). Counting of the number of hailstones impacts up to 25 impacts per second.
Measurement accuracy	For a given controlled elastic momentum impact (such as spheres of equal diameter, density, Young modulus, falling speed and incidence angle), the response of the instrument varies typically by $\pm 10\%$, depending on the spatial position of the impact on the disc and on the instrument ($\pm 10\%$ variability between two instruments).
Particle velocity	Not measured.

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.
Hail scaling	Sensitivity @voltage range +2.5V: [100 mV/(hits/s)] i.e. +2.5V corresponds to 25 hits/s
	Sensitivity @voltage range +5V: [200 mV/(hits/s)] i.e. +5V corresponds to 25 hits/s

Mechanical data	
Material	Stainless steel, plastic and anodized aluminum (breakdown voltage > 40 V/ μ m)
Installation	Universal mounting kit provided (ordering reference: RFBRA)
Weight	1.4 kg without mounting kit
Dimensions (H×W×D)	260 mm × 430 mm × 160 mm with mounting kit

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

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%).

Environmental conditions	
Temperature range	-40°C to $+80^{\circ}\text{C}$. Can even operate over this range.
Relative humidity	0 to 100%
Protection	IP67, survive to 1 m temporary immersion in salt water
Standards	EN 61326-1: 2013, CE compliant 2014/30/EU, CE compliant

