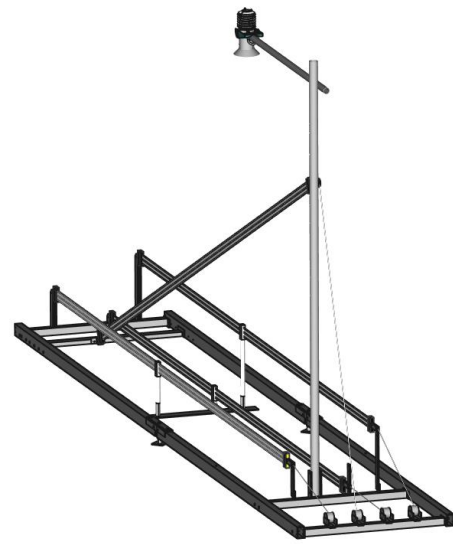# SPA-2

Snow pack analyzer

Determination of snowpack-properties can be very challenging as they vary significantly in space and time. The SPA-2 snow pack analyzer measures the volumetric contents of ice and water within a snowpack, and together with the snow depth calculates the snow water equivalent (SWE) and snow density.

By measuring the complex impedance along multiple, 4.8 m long, ribbon-shaped sensors, the SPA-2 acquires area-averaged data about the snowpack at different depth. Other than that, the snow height is precisely measured with the contact-free ultrasonic level sensor USH-9. This sensor-combination provides an automatic measurement system to continuously monitor the snowpack development for hydrological, agricultural and other applications.

Versions

Art	Version
21176	2.5-m standard version for snow heights up to 2.5 m; includes supporting frame, 1x horizontal ribbon-sensor for level 100 mm, 1x sloping ribbon sensor, USH-9 and controller cabinet.
21177	5-m standard version for snow heights up to 5 m; includes supporting frame, 1x horizontal ribbon-sensor for level 100 mm, 1x sloping ribbon sensor, USH-9 and controller cabinet.

Scope of delivery

Qty	Name
1	SPA-2 in the required version
1	Manual and Commander Software on USB stick

Accessories

Art	Accessories
19294	USB to RS485 embedded converter cable, 1.8 m
20488	Commander support software
20700	SPA-ribbon sensor set for horiz. 300-mm mounting; including tension spring and winch
20694	SPA-ribbon sensor set for horiz. 500-mm mounting; including tension spring and winch

Specifications

Physical and environmental	
Power supply	9...28 VDC; Reverse voltage protection, overvoltage protection
Power consumption at 12 VDC	max. 65 mA active 1mA in sleep mode
Outputs	RS-485 SDI-12 Analog output 4...20 mA (14 bit, max. load 200 Ω) Digital output (low: 0V, high: V_{supply}, max. 30 mA at V_{supply}-0.5 V)
Operating temperature	-35...60 °C (-31...140 °F)
Storage temperature	-35...60 °C (-31...140 °F)
Rel. humidity	0...100 %
Protection rating	Sensors IP 66 Controller IP 54 (IP 66 if contained in electrical cabinet)
Lightning protection	Integrated protection against indirect lightning with a discharge capacity of 6 kA Ppp

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Physical and environmental	
Housing material	Aluminium
Size L x W x H	2.5-m version: 6360 x 1100 x 3700 mm (250.39 x 43.31 x 145.67 in) 5.0-m version: 6360 x 1100 x 5700 mm (250.39 x 43.31 x 224.41 in)
Weight	2.5-m version: 110 kg (242.5 lb) 5.0-m version: 115 kg (253.5 lb)