

SNU – Sonic sensor for water level and snow depth measurements (Rev.0 031022)



Description

SNU are ultrasonic level sensors without contact with the surface whose the distance it's measured.

The sensor consists of a sonic transducer in air, able to transmit a pulses array and receive the answer eco; the delay of this answer depends on the distance from the sensor and the measuring surface.

Between a specific algorithm the sensor microprocessor calculates the distance reproducing it as an output electrical signal.

Since the sound speed depends on air temperature, the SNU has a temperature compensation system to get the corrected measurement value. These features make it possible to use the sensor outside both as hydrometer and snow gauge.

Besides SNU requires a DC supply voltage from 10 to 30Vdc and a low power consumption with auto shut-down: in this way the sensor is suitable for systems powered by solar panel. SLU is available with analog outputs 4...20mA (standard) or 0...5Vdc (on request).

Advantages

- ✓ High accuracy, excellent long term stability
- ✓ Integrated protection against overvoltages and polarity inversions
- ✓ Compact and robust
- ✓ Universal bracket for mounting on horizontal or vertical pole ($\varnothing$ max 42mm) or over wall surface

Main Applications

- ✓ Hydrology and geology
- ✓ Meteorology and glaciology (snow height measuring)
- ✓ Sea level measuring and marine applications
- ✓ River level and surface water measuring (lakes, streams, creeks, water-basin, ...)
- ✓ Aqueducts, Sewerages, Drainage networks, etc...
- ✓ Industrials measuring

Technical Specs

Model	SNU6
Standard measuring range	350...6000mm (other ranges on request)
Transducer	42KHz Sonic
Output	4...20mA (or 0...5Vdc on request)
Power supply	10...30Vdc
Current consumption	Vers. -I (current): 30mA@24Vdc Vers. -V (voltage): 10mA@12Vdc
Max Load resistance	100 Ohm@12Vdc 400 Ohm@24Vdc
Accuracy (dev. from the value)	<0,2% of measured value
Repeatability	<0,1% of measured value
Resolution	1mm
Response time	100ms with stabilization of the output measurements
Operating temperature	-40...+70°C
Connector	IP68 quick coupling

Sensor housing & materials	Housing: Polyester, IP65 protection degree Sensor head: Epoxy resin, glass, polyurethane, IP67 protection degree
Mounting	On the wall: between n.2 ø6mm dowels (distance between dowels: 50mm) On the pole: between STF-UNI Universal support for horizontal or vertical poles ømax:42mm
Dimensions & Weight	Corpo Sensore: 80 x ø60mm, 110g Staffa: 170 x 130 80mm, 180g
Certifications	CE

Electrical Connection

Model	SNU6-I (Current output)	SNU6-V (Voltage output)
Electrical output	4...20mA (where 4mA=350mm; 20mA= 6000mm)	0...5Vdc (where 0Vdc=350mm; 5Vdc= 6000mm)
Shunt resistive load	25...440Ω (tip.100Ω)	
IP68 Sensor connector	Pin1: Iout+ Pin2: Pin3: Pin4: Gnd Pin5: +Vdc (10...30Vdc)	Pin1: Vout+ Pin2: Vout- Pin3: Pin4: Gnd Pin5: +Vdc (10...30Vdc)
Corrective formula (cm)	$\{[(I_{out}-4)/16] * 565\}+35$	$[(V_{out}/5000)*565]+35$

Accessories

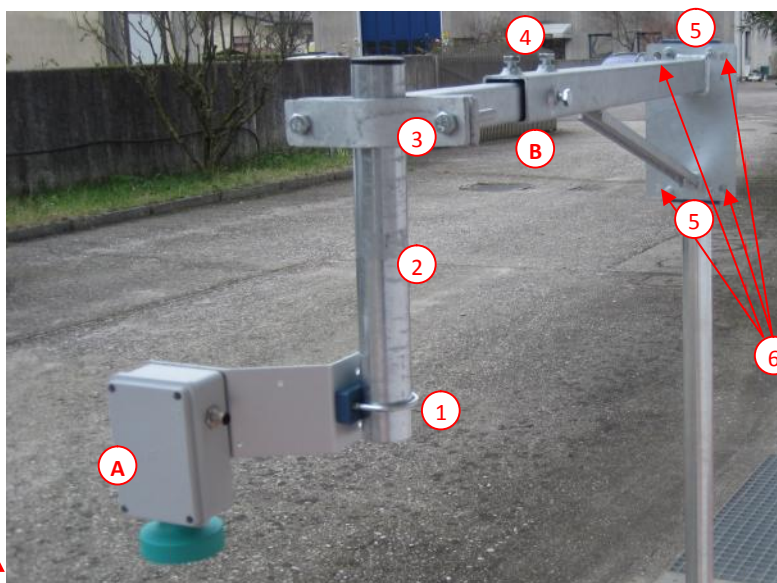
Cable	Shielded for outdoor. Available lengths: 4, 12, 22m (others upon request)
Cod. CSxx (xx= meters of cable)	Sensor cable with IP68 connector (sensor side) and open wires (datalogger side)
Cod. CSDxx	Sensor- Geoves' datalogger cable with IP68 connector (sensor side) and terminal (datalogger side)

Mounting bracket	Zinc-coated steel
SID150	Cantilever bracket adjustable Lmax = 140cm for radar or ultrasonic hydrometer with plate for wall and collars (U-Bolts) for pole mounting ø40...60mm. Note: The bracket is directly applicable on the pole of hydro-meteorological station mod. PFX-55 (see pictures)
SID75	Adapter for SID150 bracket, suitable for mounting on the bridge. The support can be mounted on poles ø25...76 mm (using the U-bolts supplied) or wall (without U-Bolts) starting the plate with four holes ø10mm (distance C=80 mm) or 4 holes ø12mm (distance C1=95 mm)

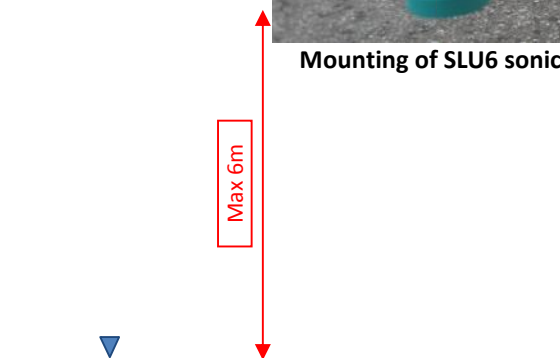
Support code	Plate (mm)	Pipe (mm)	A (mm)	B (mm)	C (mm)	C1 (mm)
SID150	250x150x5	□50x50	750...1400	250	69; fori ø10	130; fori ø14
SID75	160x130x2,5	ø40	320	460	80; fori ø10	95; fori ø12

Installation

Application	Mounting	Procedure
Surface water (rivers, streams, lakes, etc ...)	In the maximum measuring range of sensor	Mount the sensor perfectly horizontal and above the point where the water flow is more significant. The sensor bracket must be fairly protruding to avoid that the measuring conical beam does not strike the slab of the bridge. Note for installation on the bridge: fix the hydrometer on the downstream side of the bridge so that any solid debris carried by the floods do not damage the sensor.

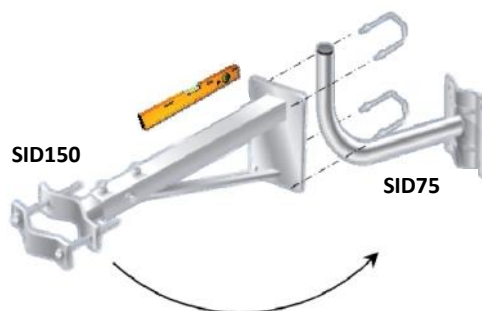


Mounting of SLU6 sonic hydrometer and of SID150 fixing bracket



Legend

- A) SNU6-I Sonic level sensor, range 0...6m
- B) SID150 Boom for sonic or no contact level sensor, Lmax 140cm (150cm with STF-UNI bracket)
 - 1. U-bolt for poles $\varnothing$ max 45mm (STF-UNI bracket)
 - 2. Vertical pipe L=30cm to join STF-UNI to SID150. **Important Note:** if the distance between the sensor and the surface water is > 6m, replace this pipe with another one longer (max 2m) that allow to be closer to the water going back in the hydrometer measuring range. Example: if the distance between the green head sensor and the water surface is 6,5m, use a pipe at least 1m long
 - 3. Pole strap for vertical pipe $\varnothing$ min40mm
 - 4. Fastening screws for prolongation of SID150 cantilever bracket extensible part
 - 5. N.2 u-bolt for mounting on poles $\varnothing$ 45....60mm (remove if the installation will be done on the wall. However it's advisable fastening on a tubular pole to allow the bracket rotation and the easy and safe maintenance of the hydrometer especially in the cantilever installations (eg.: bridges, walkways, piers, etc... see Picture 1)
 - 6. N.4 holes for wall mounting



Picture 1 – Possible SID150 rotation with SID75 bracket

Installation important note

If the bracket SID150 is fastened on pole or wall, check with a spirit level that the square section pipe were parallel to the ground. In this way the pulses beam emitted by the sensor will be perpendicular to the underlying surface to be measured (see Picture 1).



Picture 1 – Example of hydrometric station with sonic water level sensor