

# ULTRASONIC SNOW LEVEL Sensor

*t023 TNU-K*



Sound electronic filtering

Self-correction of the measurement for compensation of the air temperature

Compact and affordable

# Description

TNU-K sensors capture snow level up to either 4 or 10 meters, according to the model in use (TNU04, TNU08). Functioning system is related to the emission of short ultrasonic frequency pulses towards the depth of snow to investigate and to the subsequent reception of the reflected wave, generated once the pulses reach the surface the snow is lying on.

It ensures excellent performance for what concerns accuracy, thanks to a system of self-correction of the level measurement. Indeed, by means of an integrated temperature sensor, it can easily take into account the variation of the sound speed as a value depending on the density of the air.

The on-board electronics calculates the level as a function of the time between the emission of the signal and the reception of pulses. In particular, TNU-K is equipped with an amplification and collection system specifically designed to be implemented on snow level investigations. In fact, the snow has a high sound-absorbing property (it reflects the pulse not only from the external surface, but also from the deeper layers).

A protective body composed of a special self-ventilated solar shading contains the transducer and protects it from weather conditions, allowing to achieve a proper measurement of the air temperature. The sensor is supplied with power and signal cable (12m).



## Main Features

- **Sound electronic filtering**
- **Compact and affordable**
- **Self-correction of the measurement for compensation of the air temperature**
- **Equipped with self-ventilated solar shading**
- **Available with heater (as option)**

## Technical Specifications\*

### Measurement performance

#### Distance [m]

Measurement range (TNU04)	0 ÷ 4 m
Measurement range (TNU08)	0 ÷ 10 m
Accuracy	± 1 cm
Resolution	0.5 cm
Beam width(3dB)	12° ± 2°

### Operating conditions

Temperature	-20 ÷ +65 °C
Humidity	0% ÷ 100%

### Outputs

	TNU04	TNU08
RS485-Modbus	Temperature, Snow Level	Temperature, Snow Level
Tension	0 ÷ 2 V ↔ 0 ÷ 5 m	0 ÷ 2 V ↔ 0 ÷ 10 m
Current	4 ÷ 20 mA ↔ 0 ÷ 5 m	4 ÷ 20 mA ↔ 0 ÷ 10 m

### Power supply and Consumption

Voltage supply	10 ÷ 16 Vdc		
Consumption (mA)	Min	Typical	Max
RS485 Modbus/0 ÷ 2 V (TNU04)	-	1	-
RS485 Modbus/0 ÷ 2 V (TNU08)	-	1.5	-
4 ÷ 20 mA	7	-	30
Capsule piloting power (peak)	14.4 [W]		

### Mechanical Specifications

	TNU04	TNU08
Protective body	Plastic material (ABS), aluminium and stainless steel screws	
Weight	1.6 kg	2.3 kg
Dimensions	Ø 210 mm; Height 323 mm	Ø 210 mm; Height 390 mm
Electrical connections	IP67 / 7 male poles	

### Ordering codes

Range 0÷4 m, Current output, Tension output, RS485-Modbus serial output	t023a-TNU04-IVS-K
Range 0÷8 m, Current output, Tension output, RS485-Modbus serial output	t023b-TNU08-IVS-K

\*Changes on technical performances can be applied upon request of specific calibration