



*Bio Instruments S.R.L.*

SENSORS AND SYSTEMS  
FOR MONITORING GROWING PLANTS

**SF-4z, SF-5z**

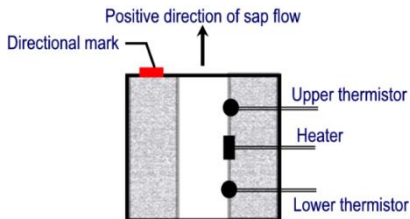
*Sap Flow Sensors*





## **Introduction**

The SF-4z and SF-5z sensors are designed for monitoring relative variations of sap flow rate in a leaf petiole or small shoot. The sensor's probe is made as a hollow collapsible heat-insulating cylinder. A spring loaded heater and a pair of bead thermistors are located inside the cylinder.



A signal conditioner provides powering of the heater and conditioning of the output signal.

All SF-type sensors are tested on the water filled hose within the approximate measurement range of 12 ml/h.

The probe is connected by a standard 1-meter cable to the waterproof box with the signal conditioner inside.

The output cable length should be specified in the order if required.

## ***Installation***

- Choose an appropriate part of stem for installing the sensor. Make sure that sap flow rate in the stem does not exceed 12 ml/h. The rough estimation may be done assuming the average transpiration rate equal to 1.5 ml/h per square decimeter of leaf surface.
- Open the sensor wide enough to place it on the stem. Make sure that the red directional mark corresponds to upward flow.



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- Make sure that the sensor is firmly placed and cannot slide or twist with application of gentle force.

- Carefully cover the sensor with two or three layers of aluminum foil in order to protect the sensor from external heat effects. It is absolutely necessary for reliable measurements.



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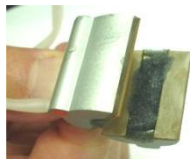
- To provide the firm positioning of a sensor on stems with diameter below 4 mm for SF-4z and 8 mm for SF-5z, insert a foam-rubber bar into the internal empty part of a sensor as it is shown below



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## **Communication**

The SF sensor communicates over the radio 2.4 GHz channel with a network data logging unit. Activation of the sensor and measurement settings are described in the Quick Start Guide of the data logging unit (PTM-50 or PM-11z Phytomonitor or PC Phyto-Logger)

## **Power**

The SF sensor is powered from the AC/DC Power Adapter.

## **Readings**

The output range is from 0 to 2 relative units with the zero offset at 0.4...0.6 relative units. It means that the output reading at zero flow rate is about 0.5. This allows to represent the reverse sap flow within the range from 0.5 to 0 output units, and the normal positive sap flow within the range from 0.5 to 2 relative units.

The SF sensor represents the end value made at the end of the measurement time interval.

## **Customer Support**

If you ever need assistance with your sensor, or if you just have questions or feedback, please e-mail at [support@phyto-sensor.com](mailto:support@phyto-sensor.com). Please include as part of your message your name, address, phone, and fax number along with a description of your problem.

## Specifications

	SF-4z	SF-5z
Measurement range	Not specified	
Approximate range of 12 ml/h was determined on a stem simulator – a fiber-filled PVC hose with 5 mm in diameter.		
Output	Analog linear output with zero offset at 0.4...0.6 relative units	
Output Range	0 to 2 relative units	
Accuracy	Not specified	
Suitable stem diameter, mm	1 to 5	4 to 10
Operating temperature	0 to 50°C	
Warm-up time of the probe	5 min	
Overall dimensions, mm	30 × 30 × 40	
Power Supply	AC/DC Power Adapter	



Phyto-Sensor Group

**Bio Instruments S.R.L.**

20 Padurii St., Chisinau MD-2002

REPUBLIC OF MOLDOVA

Tel./Fax: +373-22-550026

[info@phyto-sensor.com](mailto:info@phyto-sensor.com)

[www.phyto-sensor.com](http://www.phyto-sensor.com)