



Bio Instruments S.R.L.

SENSORS AND SYSTEMS
FOR MONITORING GROWING PLANTS

SF-xT-SDI12 **(SF-4T-SDI12, SF-5T-SDI12)**

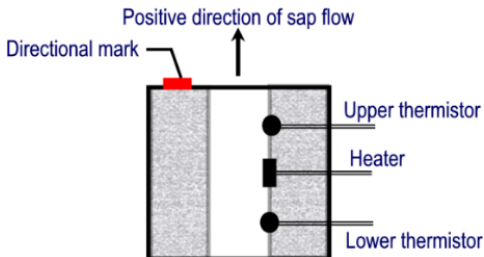
Sap Flow Sensors Quick Start Guide



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Introduction

The SF sensors is 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 heatinsulating 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.

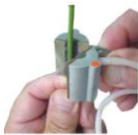
Standard output cable length is 4 meters.

Optional: Desired cable length may be specified in the order.

Interface: SDI12.

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.



- 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.



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



Connection

The sequence and correctness of the connection must be observed! The shield shall be grounded at the data loggers side or connected to the 'minus' contact of the power source.

Connection order

1	White	Ground
2	Black	Shield
3	Yellow	SDI12 Input/Output
4	Red	Power 5 to 24 Vdc

Data reading

In accordance with SDI12 Standard ([version 1.3](#)).

Decimal data format: X.XXX (relative units).

Power supply

The sensor is to be powered from an external regulated power supply with 5 to 24 Vdc @ 10 mA output voltage.

Output require at least 15 minutes excitation time for producing stable output signal.

Specifications

Measurement range		Not specified *
Output		SDI12
Output signal zero offset		0.4 Relative units approx.
Output signal range		0 to 2 Relative units
Suitable stem diam.	<i>SF-4</i>	1 to 5 mm
	<i>SF-5</i>	4 to 8 mm
Operating temperature		0 to 50°C
Warm-up time of the probe		15 min
Overall dimensions	<i>SF-4</i>	30 × 30 × 40 mm
	<i>SF-5</i>	30 × 35 × 40 mm
Power supply		from 5 to 24 Vdc @ 10 mA
Cable length		4 m

* Approximate range of 12 ml/h was determined on a stem simulator – a fiber-filled PVC hose with 5 mm in diameter.

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. Please include as part of your message your name, address, phone, and fax number along with a description of your problem.

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