



Bio Instruments S.R.L.

SENSORS AND SYSTEMS
FOR MONITORING GROWING PLANTS

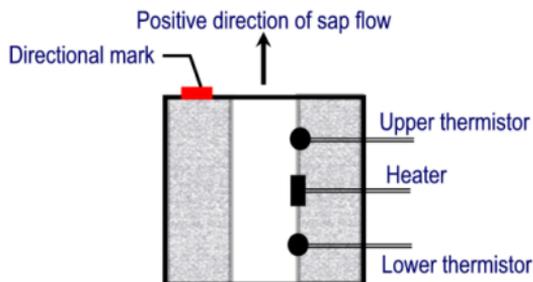
SF-4M, SF-4Mi
SF-5M, SF-5Mi

Sap Flow Sensors



Introduction

The SF-4M and SF-5M 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.



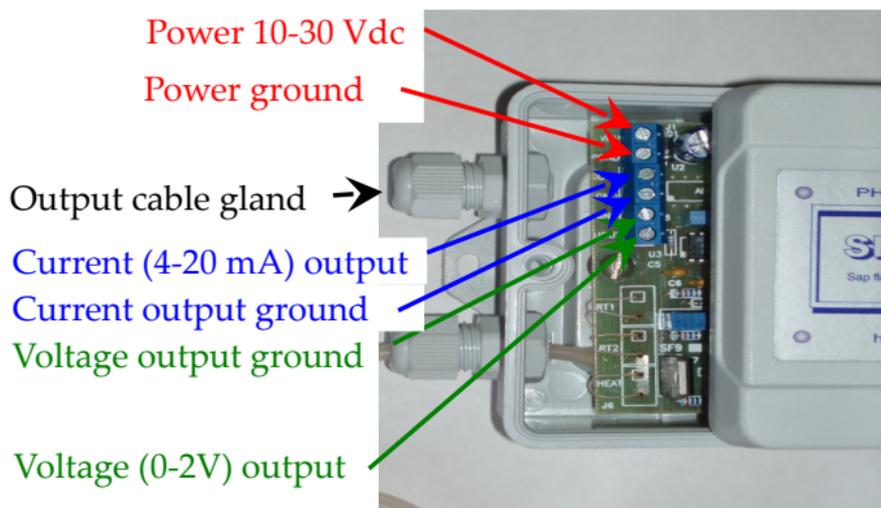
A signal conditioner provides powering of the heater and conditioning of the output signal.

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.

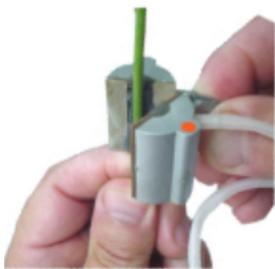
The output cable length should be specified in the order if required.

Custom cable connection



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.



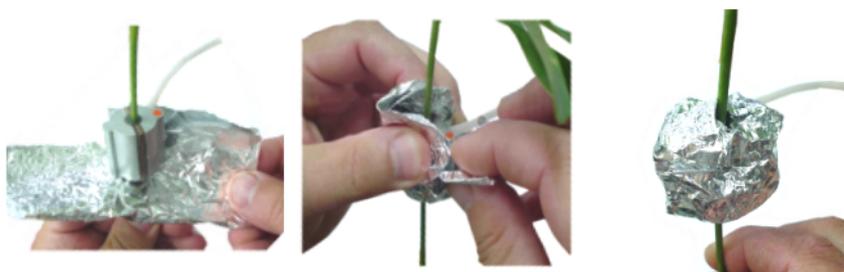
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2

- 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-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



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Specifications

	SF-4M	SF-5M
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		
SF-4/5M	0 to 2 VDC, linear	
SF-4/5Mi	0 to 2 VDC and 4 to 20 mA	
Output signal zero offset		
SF-4/5M	0.5 V approx.	
SF-4/5Mi	8 mA approx.	
Accuracy	Not specified	
Suitable stem diameter, mm	1 to 5	4 to 10
Operating temperature	0 to 50 °C	
Warm up time	5 min	
Overall dimensions, mm	30 × 30 × 40	30 × 35 × 40
Supply voltage	10 to 30 VDC @ 400 mW max	
Cable length between probe and signal conditioner	1 m	



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