

# Denrometer Increment Sensor DR 26

*User's Manual*



November 2008

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## **1 General description**

DR 26 is designed for long-term measurement of tree trunk circumference via stainless tape that encircles the tree trunk. Its length variations are measured with a rotary position sensor and put on the sensor output as an exact voltage or voltage divider ratio.

The sensor is fixed to the trunk just by the strength of the tape – no sharp or invasive fixing parts are used.

The sensor is made from UV resistant plastic, metal parts are made from stainless steel or anodized aluminum. The internal space for the electronics is water-sealed.

The sensor operates in two modes

- as a common electronic sensor with the output voltage signal proportional to the sensor position independently on the power supply voltage.
- as a passive voltage divider (ratiometric output – the output voltage depends on both power supply voltage and the sensor position).

The sensor can be connected to any common datalogger measuring d.c. voltage.

## 2 Specifications

Increment sensors type	rotary position
Range	63.5 mm of circumference
Linearity	2 % of full scale
Resolution	1 $\mu\text{m}$
Tape strength	15 to 20 N in the whole range
Operating range:	
- temperature	- 30 to 60 °C
- humidity	0 to 100 %
Operation in passive mode:	
- voltage divider resistance	5,000 ohm typically
- maximum voltage	15 Volts ( $V_b$ )
- sensitivity	64 mm @ $V_{\text{out}} = V_b$ (0 mm @ $V_{\text{out}} = 0$ )
Operation in active mode:	
- power supply voltage	4.6 to 16 Volts
- current consumption	1 mA
- sensitivity	0.0254 mm/mV
- maximum load	5 mA
Protection Rating	IP 66
Standard cable length	15 meters, four wire, shielded
Size	100 x 70 x 100 mm
Weight (excl. cable)	ca 250 g

## 3 Operation

### 3.1 Sensor installation

The unit is fixed to the tree trunk with the 12 mm wide stainless tape. The tape is cut from the spool containing 15 m of tape by a light snips. Tape length should exceed the trunk circumference for 25 cm. The installation procedure is shown in Appendix A.

#### 3.1.1 Cable wire colors

+V <sub>b</sub>	brown
- V <sub>b</sub>	green
Signal Hi	yellow
Signal Lo	white

### 3.2 Mode setting

The sensor by default is set to active mode. That means the sensor signal output is independent to power supply voltage. It fits to most of common dataloggers.

Switching to passive mode is rather seldom, used just in special applications. The switching between modes is made by a small 4-section DIP switch located below the sensor lid.

#### 3.2.1 DIP Switch setting

Unscrew six screws fixing the cover and change switch configuration. Do not forget to put back the desiccative bag. Do not open the lid longer than necessary to avoid saturation of desiccant by water vapor.

The switch setting shows the following table:

<i>DIP Switch position:</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>
Voltage divider (63.5 mm @ V <sub>max</sub> )	off	off	ON	ON
Signal output (0.0254 mm/mV)	ON	ON	off	off

## 4 Maintenance

DRL 26 unit does not need any special maintenance. **Avoid a shifting the sensor during the operation.**

## **5 Warranty**

The producer warrants right function of the measuring system for three years after it is accepted by a customer. All the faults will be removed free of charge during this time, at the measuring device itself as well as at sensors. The producer is not responsible for the faults originated by careless manipulation, incorrect operations, wrong applications or theft. The warranty covers the battery failure for three months only.

The freight to producer is paid by customer; the sending back is paid by producer.

## Appendix A

### Installation notes

*Note: Following pictures were taken with DRL26 unit. However, the installation fits to DR26 as well.*

1/ Cut a piece of tape ca 25 cm longer than the stem circumference. Avoid crumpling of the tape during the installation!



2/ Fold one end of the tape and put on the central pin



3/ Wrap the tape around the stem and than wrap it around the coil





4/ Insert the tape below the binder bar



5/ Turn the head counterclockwise in order to get at least 5 mm on the scale



6/ and fold the tape over the bar.



7/ The tape has to remain under tension – check the scale position ( $> 0$ ).

