

# 10.003 ELECTRICAL LEVEL INDICATOR TAPE

Approval Date: 20 May 1998

Reviewed on : 23 October 2007

Version: 1

## Purpose

The level tape is used to manually measure the distance to the water level in a pipe stilling well or piezometer. The manual observations are used to connect DWLR readings to a benchmark, e.g. the well head, and for validation purposes. A DWLR can only meet its accuracy specifications if it is correctly referenced to an established benchmark. The level indicator tape is one of the essential components to achieve this.

## Conditions & Requirements

- The tape and electronics should be stable and should give accurate and reproducible readings.
- The tape is to be used under a wide range of temperatures. To maintain the specified accuracy, the tape should have a low temperature coefficient for length variations.
- During its technical lifetime, the tape will be frequently unwound/rewound under wet, dry, muddy, dusty conditions. This should not affect the accuracy.
- The manufacturer should specify:
  1. the tape load (weight on the tape) required to achieve the rated accuracy, i.e. how much weight is needed to fully straighten the tape without stretching it,
  2. the longitudinal temperature coefficient of the tape, and
  3. the elongation under tension, in mm/m tape length per Newton load.
- All components that are vulnerable to the environment, e.g. battery, electronics, switches and similar, shall be properly protected against ingress of water and dust.
- The power on/off switch should be well protected against accidental switch-on during transport.
- The detection of the air-water interface should not suffer from hanging water after retrieval from immersion.

## Specifications

### 1. General

<b>tape length</b>	adequate to reach the lowest water level, e.g. 20, 50 or 100 m
<b>tape material</b>	stainless steel or fibre reinforced plastic
<b>accuracy</b>	2.5 mm/10 m @ 20°C
<b>temperature coefficient</b>	<0.0125 mm/°C/m

### 2. Sensor

<b>principle</b>	electrical conductivity
<b>resolution</b>	1 mm
<b>reaction time</b>	immediate response upon touch of the water surface and recovery from the water
<b>material</b>	non-corrosive
<b>diameter</b>	<25 mm OD
<b>suspension weight</b>	according manufacturer's specification

### 3. Readout unit

<b>signal</b>	clearly audible and bright light (on touching water surface)
<b>battery</b>	standard alkaline batteries, like AA, C or D size

<b>battery autonomy</b>	>500 measurements
<b>environmental protection</b>	IP55
<b>temperature range</b>	0 to 60°C

### **Consumables**

- batteries for sensor and indicator

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As per HP-I

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