

# 10.022 ELECTROMAGNETIC CURRENT METER

Approval Date: 20 May 1998

Reviewed on : 23 October 2007

Version: 1

## Purpose

ADCP devices have a dead zone in the top layer due to immersion and blanking of the transducers, i.e. the active area starts at some distance in front of the sensor-head. To enhance the data return and to compensate for dead zone losses, especially over shoals, the electromagnetic current meter could be used to collect velocity data in the top layer.

The electromagnetic current meter measures flow velocity in X- and Y- direction. Typically it is installed at a depth of 0.5 m at the bow of a boat.

The sensor is controlled by a dedicated signal-conditioning unit in the cabin of the boat.

## Conditions & Requirements

- The electromagnetic current meter shall be of such a design that it operates reliably and accurately under the prevailing flow and environmental conditions.
- The current meter shall be easy to operate and maintain.
- The current meter shall be supplied with the accessories as needed for effective use.
- All materials of the current meter shall be non-corrosive.
- An operator's manual, related to the type and model of the current meter, shall be part of the delivery.
- The current meter shall come with the calibration data, i.e. actual calibration velocity versus actual instrument reading as collected during the calibration process. Calibration data should uniquely identify the sensor, the readout unit, observer, rating tank, way of suspension, methodology and similar information.
- A calibration sheet for the sensor shall be provided
- The design shall be sediment resistant.
- The electrical connections shall be of a reliable and sturdy construction.
- The current meter and accessories shall be supplied in a sturdy transport case.
- Sensors shall be interchangeable without effecting the calibration of the system.
- The X-direction of the sensor shall be parallel to the longitudinal axis of the boat.
- The installation of the sensor at the bow shall be such that the sensor can be removed easily and re-installed with the same alignment.

## Specifications

### 1. Sensor

|                       |   |
|-----------------------|---|
| <b>model</b>          | ellipsoid, diameter approximately 40 mm |
| <b>range</b>          | $\pm 7.5$ m/s along each axis           |
| <b>accuracy</b>       | 1% of reading                           |
| <b>zero stability</b> | 5 mm/s                                  |
| <b>cable length</b>   | 10 m                                    |

### 2. Control unit

|                                |                          |
|--------------------------------|--------------------------|
| <b>output</b>                  | ASCII, serial RS 232     |
| <b>output update frequency</b> | 1 Hz                     |
| <b>power supply</b>            | 10 to 15 or 20 to 30 VDC |
| <b>enclosure</b>               | compliant to IP65        |
| <b>operating temperature</b>   | 0 to 50°C                |
| <b>operating humidity</b>      | 95 %                     |

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As per HP-1

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